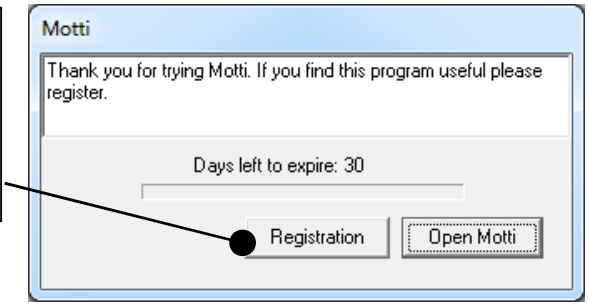
MOTTI USER'S GUIDE
version 3.2.1

Finnish Forest Research Institute

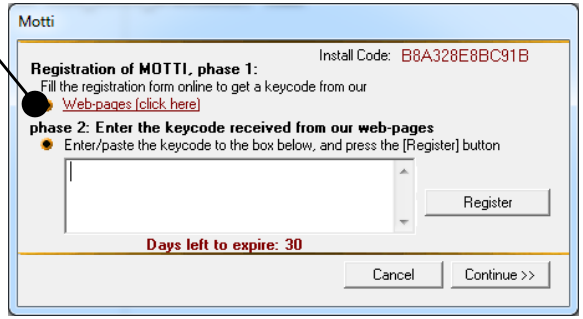
Getting started and software registration

Trial period for MOTTI is 30 days. Thereafter, registration is mandatory. Registration is important for further development and customer support. Contact information is used only to send information related to Motti-software.

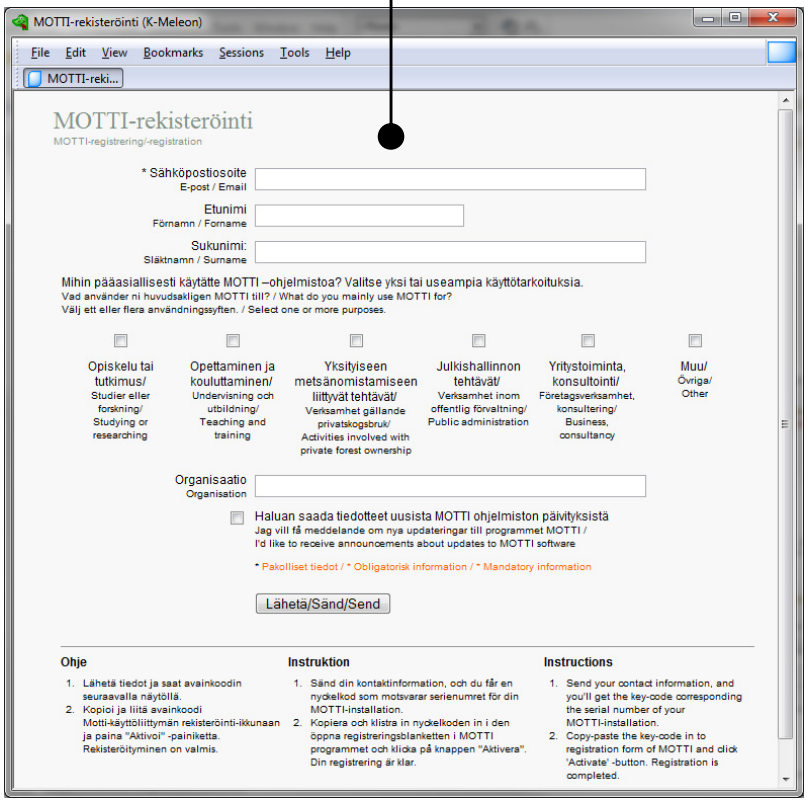
1. Start registration process by pressing ”Registration”-button


Motti
Thank you for trying Motti. If you find this program useful please register.
Days left to expire: 30
Registration
Open Motti

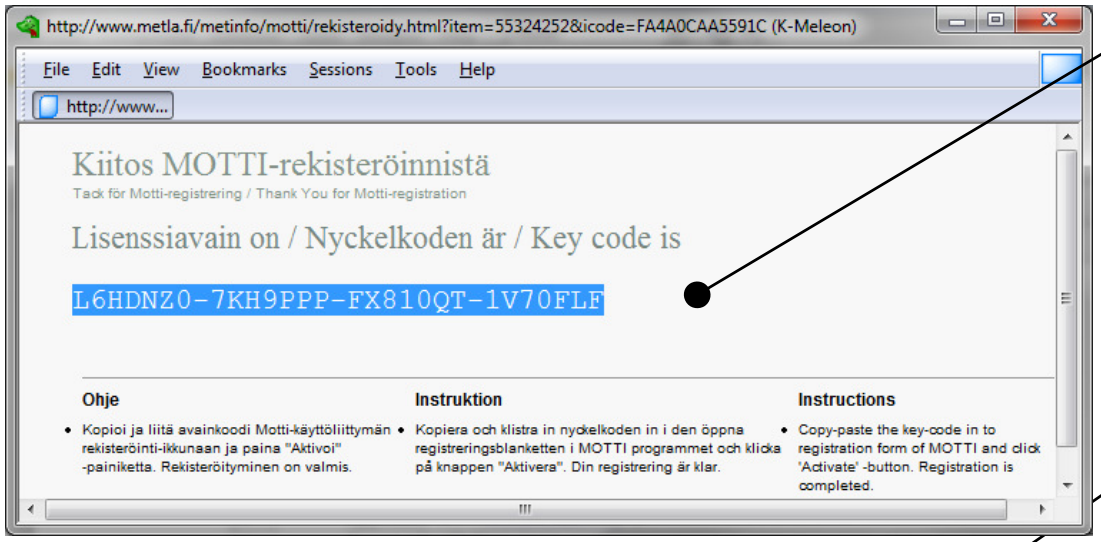
2. Click ”from web pages”- link


Motti
Install Code: B8A328E8BC91B
Registration of MOTTI, phase 1:
Fill the registration form online to get a keycode from our
Web-pages (click here)
phase 2: Enter the keycode received from our web-pages
Enter/paste the keycode to the box below, and press the [Register] button
Register
Days left to expire: 30
Cancel
Continue >>

3. Fill in registration form and press ”Send”-button.


MOTTI-rekisteröinti (K-Meleon)
File Edit View Bookmarks Sessions Tools Help
MOTTI-reki...
MOTTI-rekisteröinti
MOTTI-registrering/-registration
* Sähköpostiosoite
E-post / Email
Etunimi
Förnamn / Forname
Sukunimi:
Släktnamn / Surname
Mihin pääasiallisesti käytätte MOTTI –ohjelmistoa? Valitse yksi tai useampia käyttötarkoituksia.
Vad använder ni huvudsakligen MOTTI till? / What do you mainly use MOTTI for?
Välj ett eller flera användningssyften. / Select one or more purposes.
Opiskelu tai tutkimus/ Studier eller forskning/ Studying or researching
Opettaminen ja kouluttaminen/ Undervisning och utbildning/ Teaching and training
Yksityiseen metsänomistamiseen liittyvät tehtävät/ Verksamhet gällande privatskogsbruk/ Activities involved with private forest ownership
Julkishallinnon tehtävät/ Verksamhet inom offentlig förvaltning/ Public administration
Yritystoiminta, konsultointi/ Företagsverksamhet, konsultering/ Business, consultancy
Muu/ Övriga/ Other
Organisaatio
Organisation
Haluan saada tiedotteet uusista MOTTI ohjelmiston päivityksistä
Jag vill få meddelande om nya updateringar till programmet MOTTI /
I'd like to receive announcements about updates to MOTTI software
* Pakolliset tiedot / * Obligatorisk information / * Mandatory information
Lähetä/Sänd/Send
Ohje
1. Lähetä tiedot ja saat avainkoodin seuraavalla näytöllä.
2. Kopioi ja liitä avainkoodi Motti-käyttöliittymän rekisteröinti-ikkunaan ja paina "Aktivoi" -painiketta. Rekisteröityminen on valmis.
Instruktion
1. Sänd din kontaktinformation, och du får en nyckelkod som motsvarar serienumret för din MOTTI-installation.
2. Kopiera och klistra in nyckelkoden in i den öppna registreringsblanketten i MOTTI programmet och klicka på knappen "Aktivera". Din registrering är klar.
Instructions
1. Send your contact information, and you'll get the key-code corresponding the serial number of your MOTTI-installation.
2. Copy-paste the key-code in to registration form of MOTTI and click 'Activate' -button. Registration is completed.

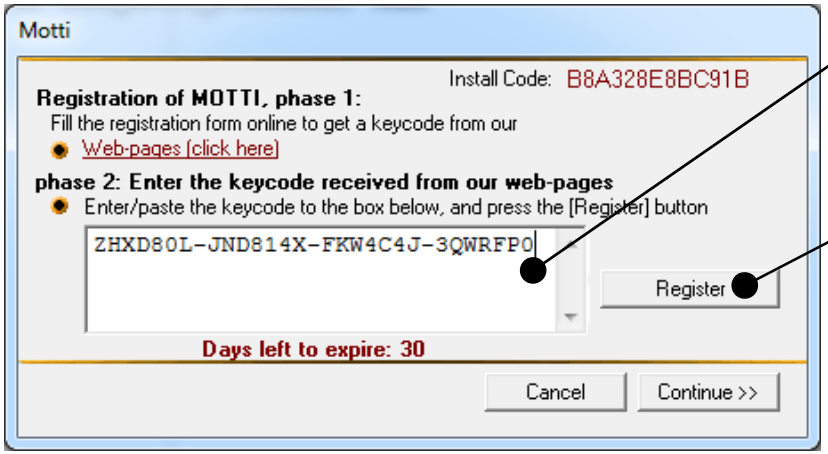
Getting started and software registration


http://www.metla.fi/metinfo/motti/rekisteroidy.html?item=55324252&icode=FA4A0CAA5591C (K-Meleon)
File Edit View Bookmarks Sessions Tools Help
http://www...
Kiitos MOTTI-rekisteröinnistä
Tack för Motti-registrering / Thank You for Motti-registration
Lisenssiavain on / Nyckelkoden är / Key code is
L6HDNZ0-7KH9PPP-FX810QT-1V70FLF
Ohje
Kopioi ja liitä avainkoodi Motti-käyttöliittymän rekisteröinti-ikkunaan ja paina "Aktivoi" -painiketta. Rekisteröityminen on valmis.
Instruktion
Kopiera och klistra in nyckelkoden in i den öppna registreringsblanketten i MOTTI programmet och klicka på knappen "Aktivera". Din registrering är klar.
Instructions
Copy-paste the key-code in to registration form of MOTTI and click 'Activate' -button. Registration is completed.

4. Here is your key code

5. Move back to registration window of Motti and copy-paste the key code from the web browser.

You can also enter the key by typing it.


Motti
Install Code: B8A328E8BC91B
Registration of MOTTI, phase 1:
Fill the registration form online to get a keycode from our
Web-pages (click here)
phase 2: Enter the keycode received from our web-pages
Enter/paste the keycode to the box below, and press the [Register] button
ZHXD80L-JND814X-FKW4C4J-3QWRFP0
Register
Days left to expire: 30
Cancel
Continue >>

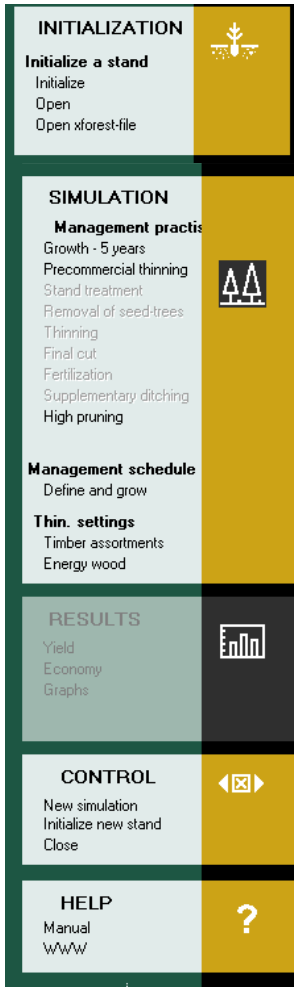
6. Press the Register-button to complete the registaration procedure.

After registering you will get a confirmation message.

Motti will launch after pressing OK-button.

Using Motti-software

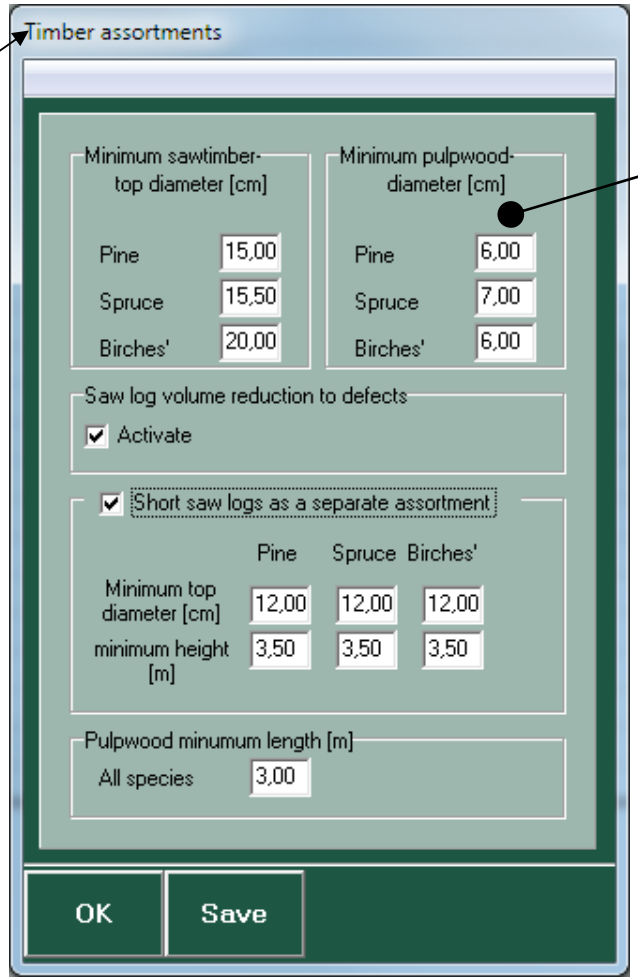
Step-by-step instructions:



1. **INITIALIZATION**. First you have to create or import a stand. There are three possibilities to create a stand. You can enter stand data interactively, you can open data that you have already entered and saved, or you can open a pmt-file.
2. **SIMULATION.** Here you can guide the simulation step by step or select automatic simulation.
3. **RESULTS.** In this section you can compare yield and economy.
4. **CONTROL.** Here you can start a new simulation with current stand or start all over by selecting a new stand.

User's Guide conventions

The User's Guide is based on captured views from the application.



The actual user's instructions are in text boxes with white backgound.

Ball-ended lines point to the current topic

General features of the application are in text boxes with blue background

ATTN! Text boxes with red background include restrictions and important recommendations.

HELP
Manual
WWW
?

You can open the user's guide by clicking HELP- > Manual

About using Motti-software

1. **Product licence**

   You are not allowed to distribute the application or its components. Results produced with MOTTI may not be sold, published or otherwise distributed without a written permission from Finnish Forest Research Institute.

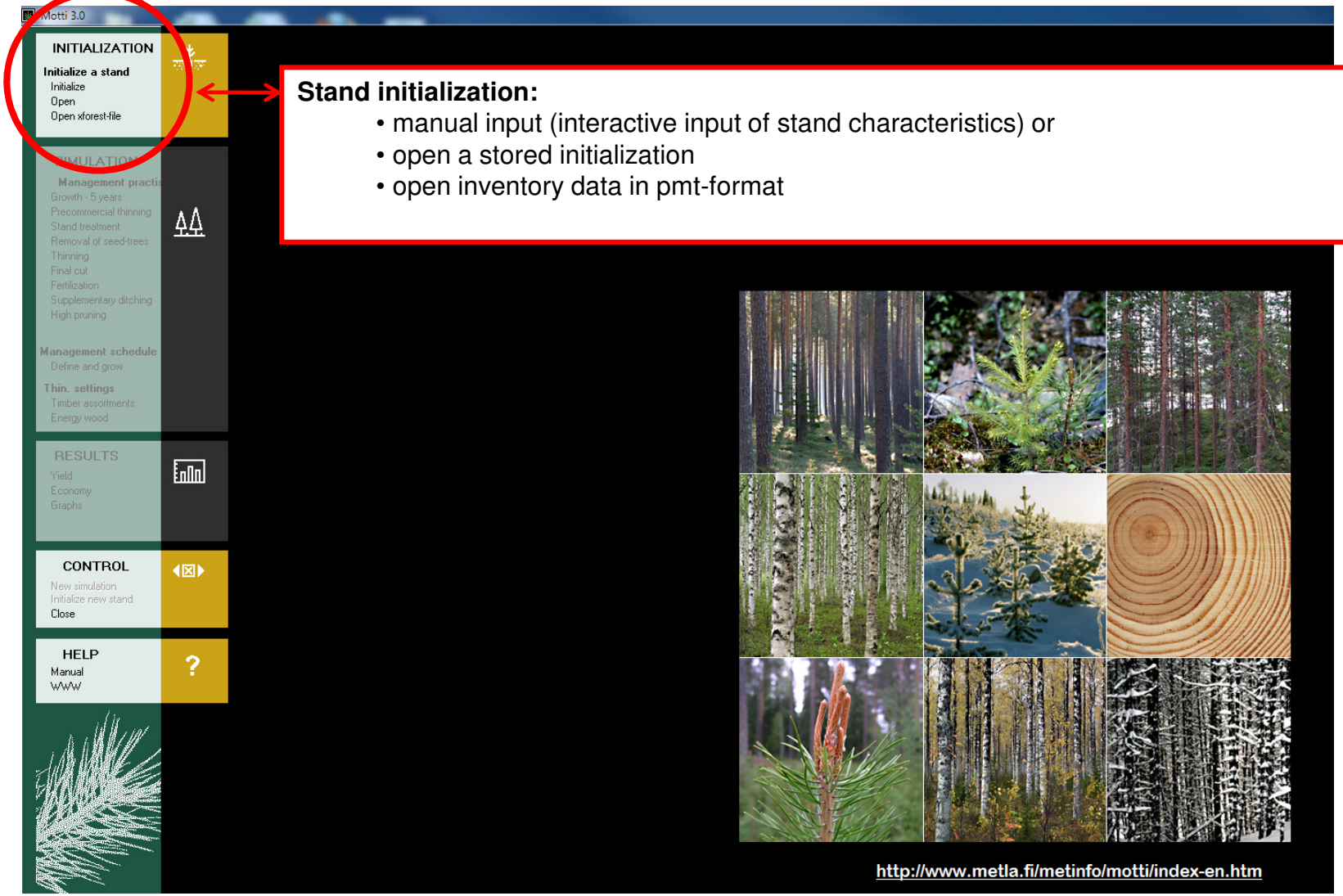
2. **Customer support**

   Inquiries should be directed to e-mail address motti.metinfo@metla.fi.

3. **System requirements**

   MOTTI –application is designed for Windows 7, Windows 2000 ja Windows XP –operation systems. Display resolution must be at least 1024 x 768 pixels. Installation requires approximately 20 Mb of free space on hard drive. **ATTN! The user must have write –priviledge to MOTTI –folder (the target folder can be selected during installation procedure).**

1. INITIALIZATION



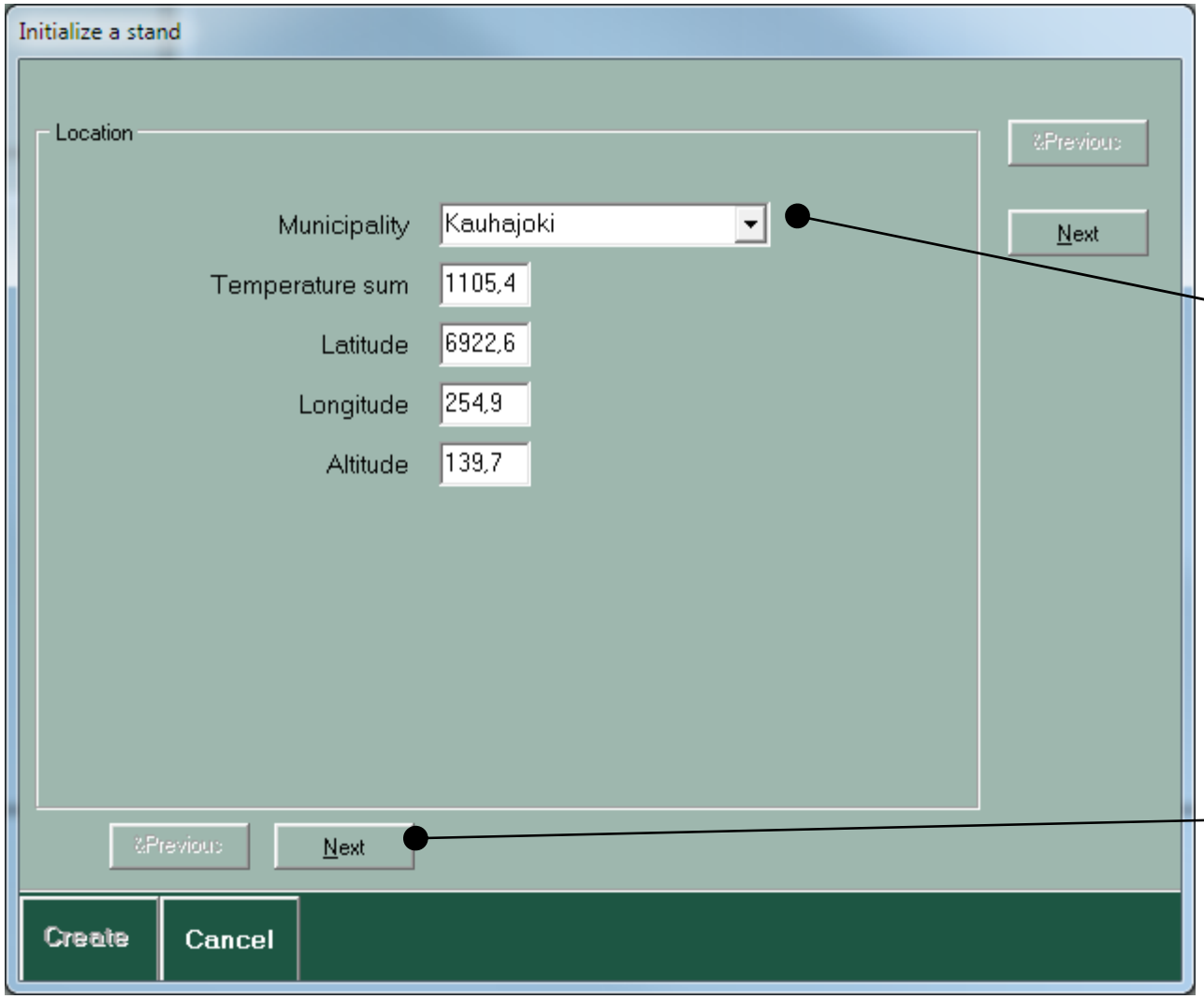
Stand initialization:

- manual input (interactive input of stand characteristics) or
- open a stored initialization
- open inventory data in pmt-format

http://www.metla.fi/metinfo/motti/index-en.htm

1.2. Initialization of stand data

Select: Initialize a stand → Initialize Location

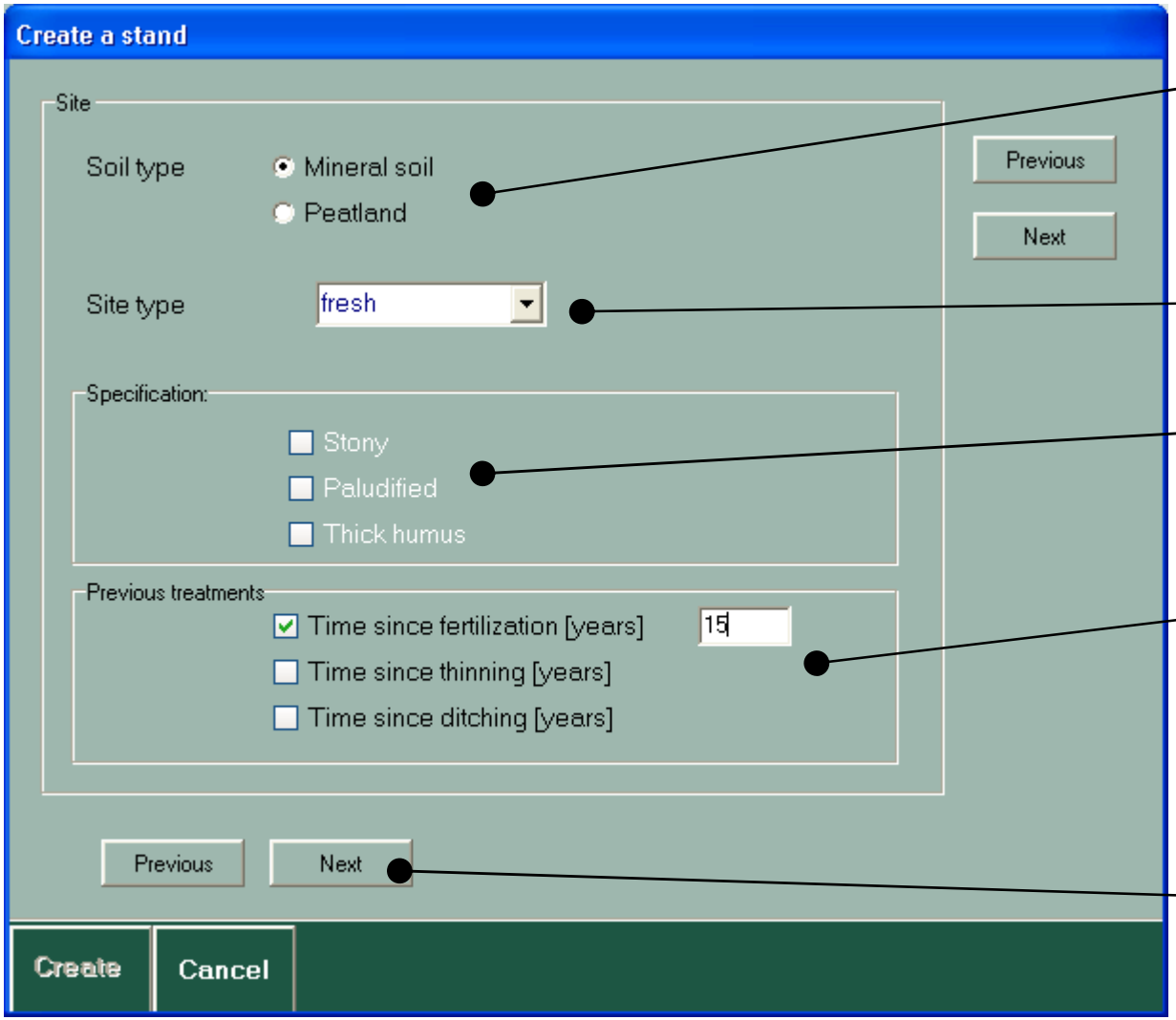


Select the municipality of the stand.
Based on that selection, MOTTI automatically retrieves
- temperature sum
- coordinates
- altitude

When you are ready to proceed, click Next

1.2. Initialization of stand data (2/8)

Site quality and applied management practices



Select soil type (mineral soil or peatland)

Select site type

Optional specifications of the site

Define time since the implementation of management practices

When you are ready to proceed, click Next

1.2. Initialization of stand data (3/8)

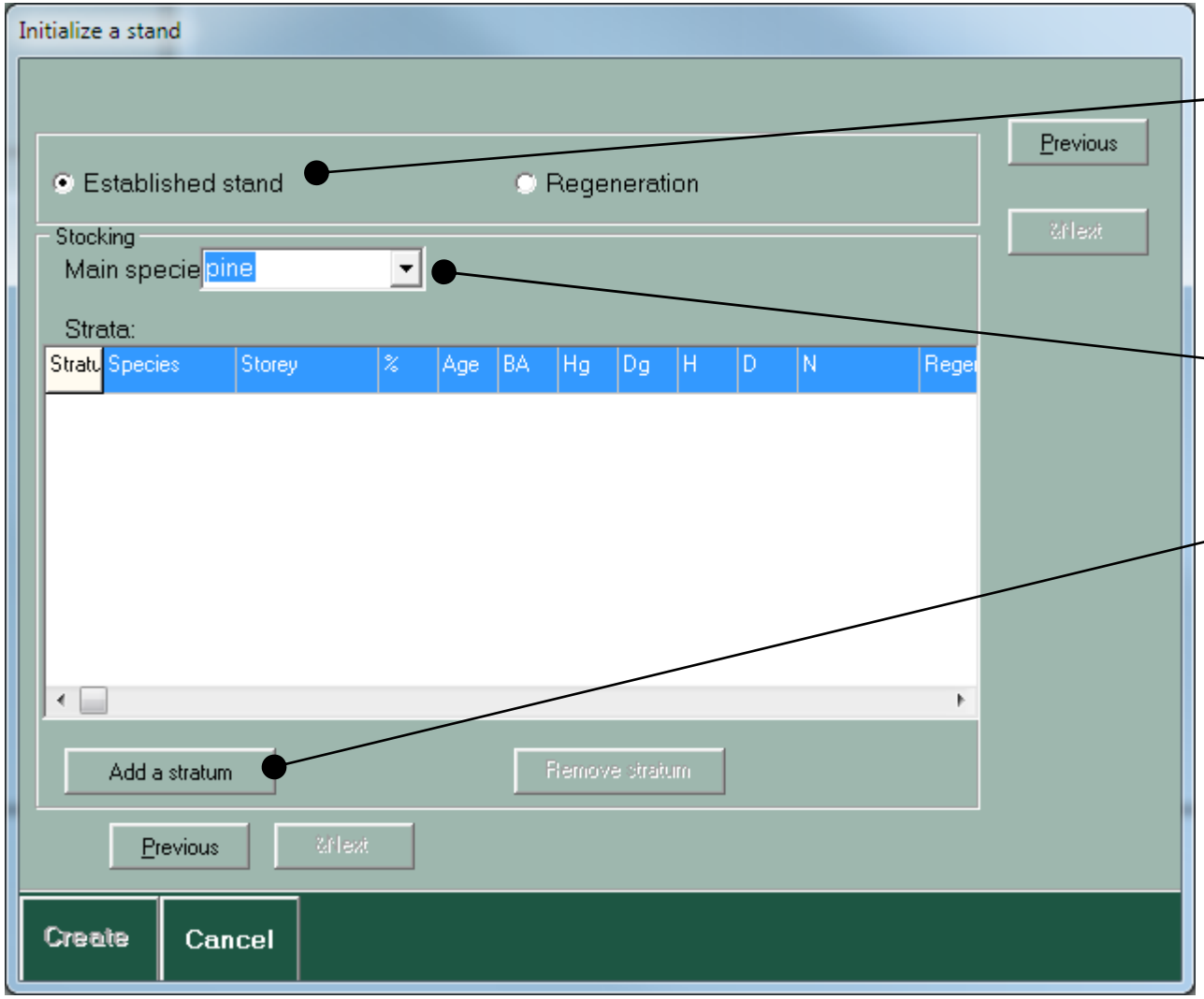
Define the initial stocking to be simulated either:
Simulation of an established stand (see chapter 1.2 (4/7))
or
Start the simulation from the regeneration (see chapter 1.2.(7/7))

When you start the simulation from the regeneration, Motti predicts the amount of naturally regenerated seedlings. Tree species and the number of these volunteers depend on site type and the amount of seed trees. Naturally regenerated seedling will be predicted also on artificially regenerated sites (after seeding or planting).

ATTN!
You can start the simulation from the regeneration phase only on mineral soil sites. On peatland sites, initial stand has to be an established stand with mean height more than four meters.

1.2. Initialization of stand data (4/8)

Established stand



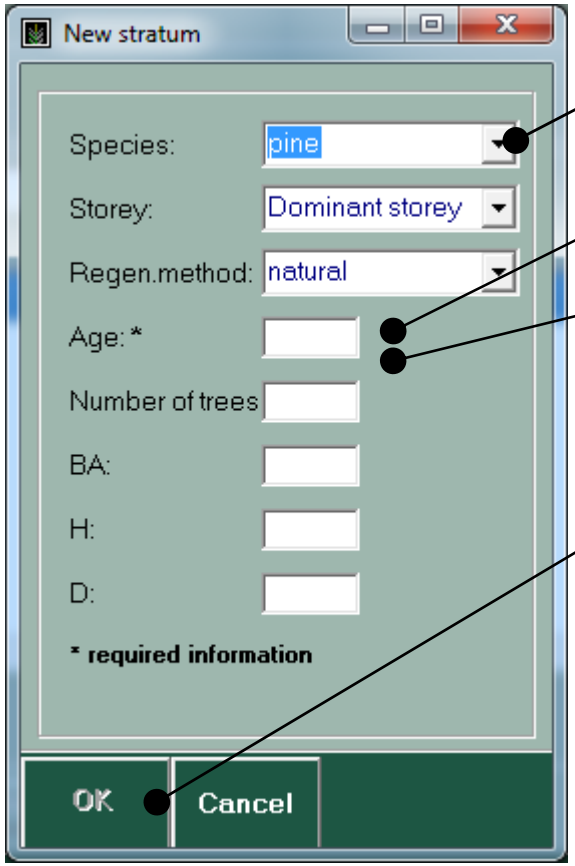
Choose the simulation of an established stand

Choose dominant tree species

Stocking data are given separately for each stratum. Start by clicking here.

1.2. Initialization of stand data (5/8)

Stocking data



Specify the main species, tree storey, and regeneration method of the stratum.

Add stand information: stand age is a mandatory information. Fill in also other known characteristics. Leave the unknown data fields empty.

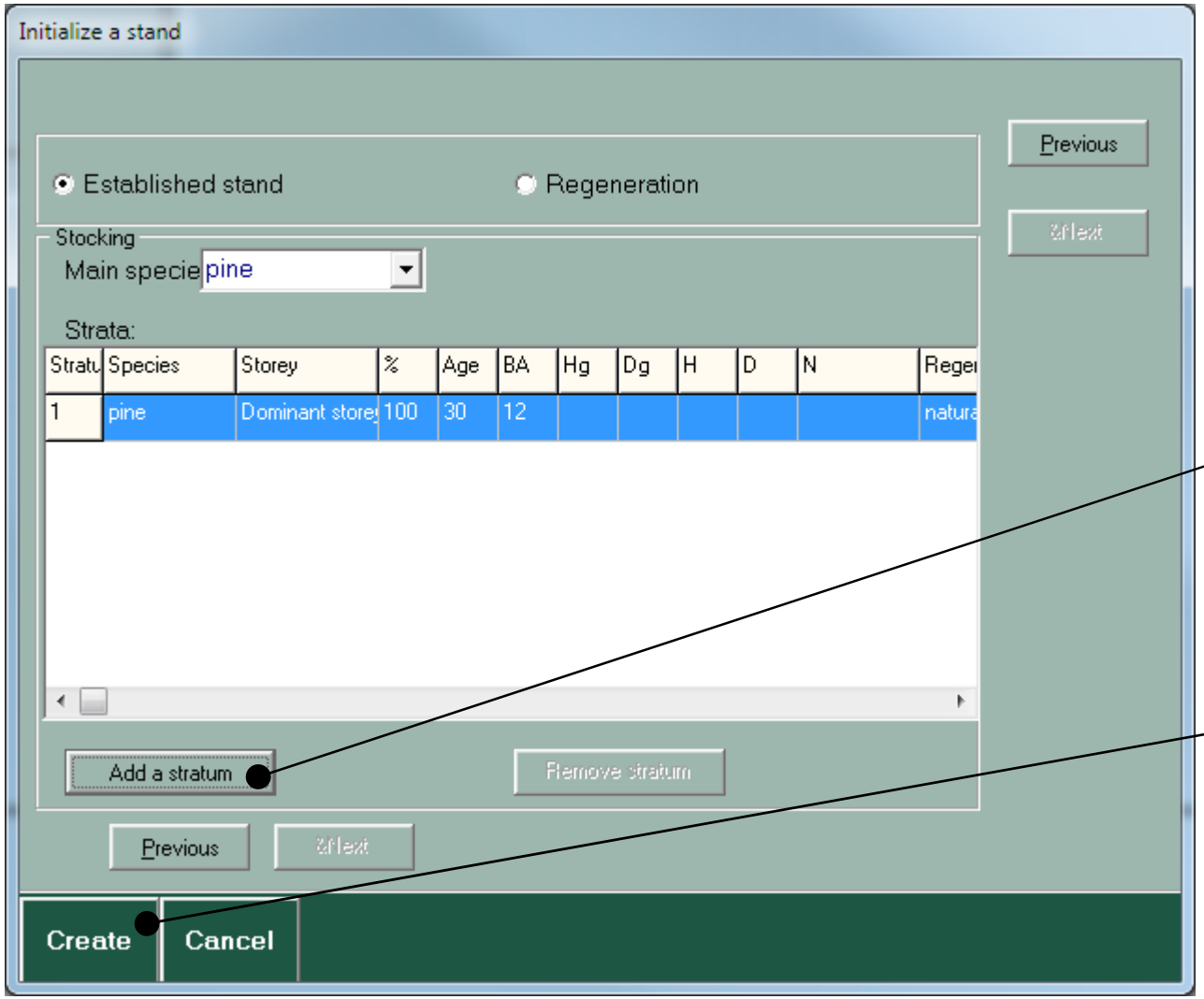
ATTN! On drained peatlands stand age depicts the time elapsed from ditching.

When the stratum is defined, click "OK"

ATTN! If you give the basal area, use also basal-area-weighted mean diameter and basal-area-weighted mean height. If you only give number of trees (N) and not basal area, use arithmetic mean height and arithmetic mean diameter.
In young (sapling) stands, it is recommended to give at least the number of trees and the mean height of stand.

1.2. Initialization of stand data (6/8)

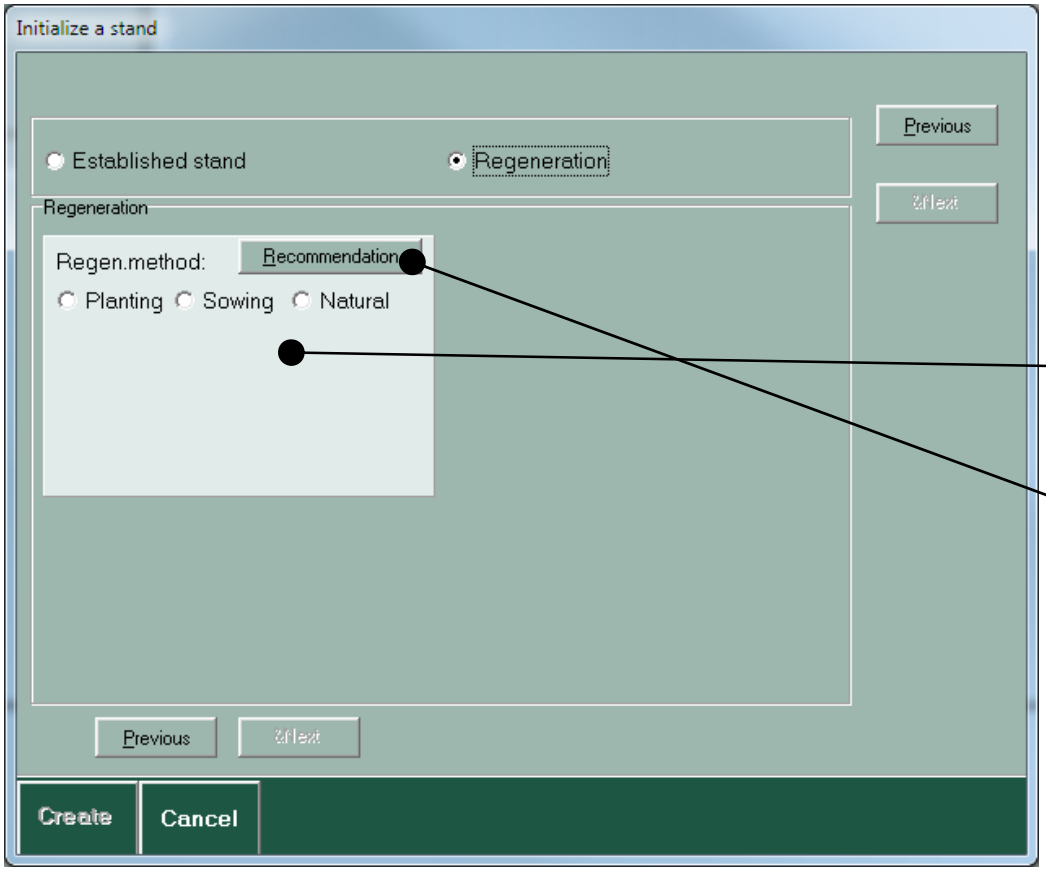
Stocking data



If you want to add a new stratum, click "Add a stratum"-button.

When you are finished, click "Create"-button.

1.2. Initialization of stand data (7/8)



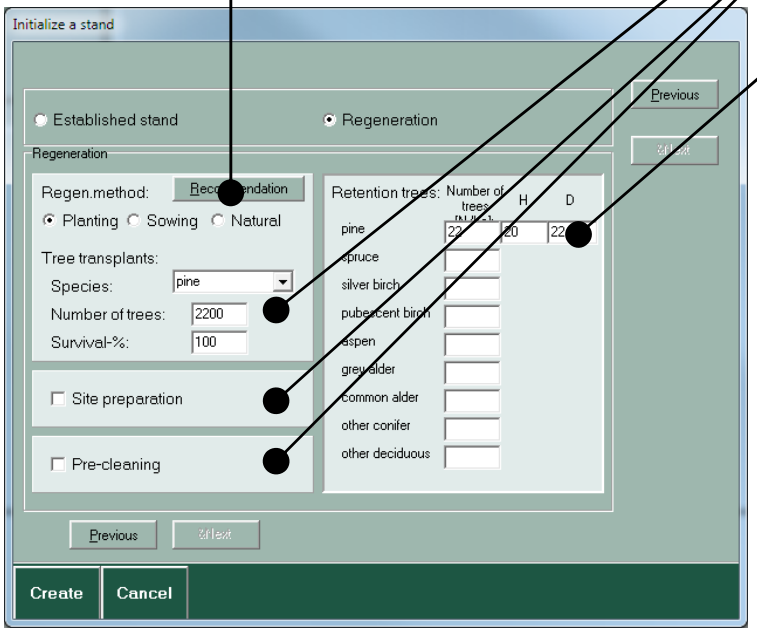
Select the regeneration method :
- planting or
- sowing or
- natural

You can also choose the ”recommendation”-button and Motti makes the choices.

1.2. Initialization of stand data (8/8)

Artificial regeneration:

Select the regeneration method first.



Give the information of the seed trees.

Define if site preparation and/or clearing of regeneration area will be carried out.

Regeneration

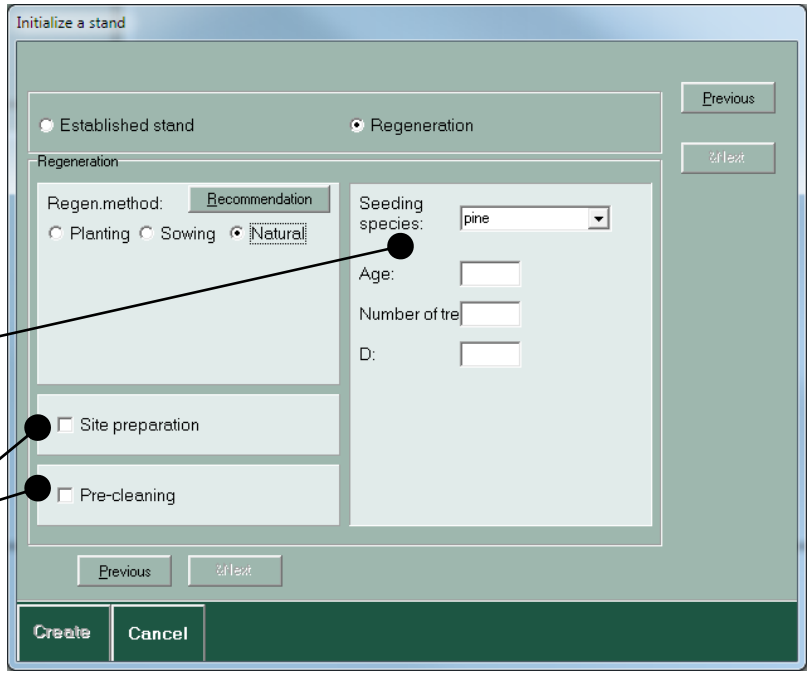
Give dominant tree species, number of planted/seeded trees, and survival rate (%).

Choose if site preparation and/or clearing of regeneration area will be carried out.

You may provide the information of the retention trees.

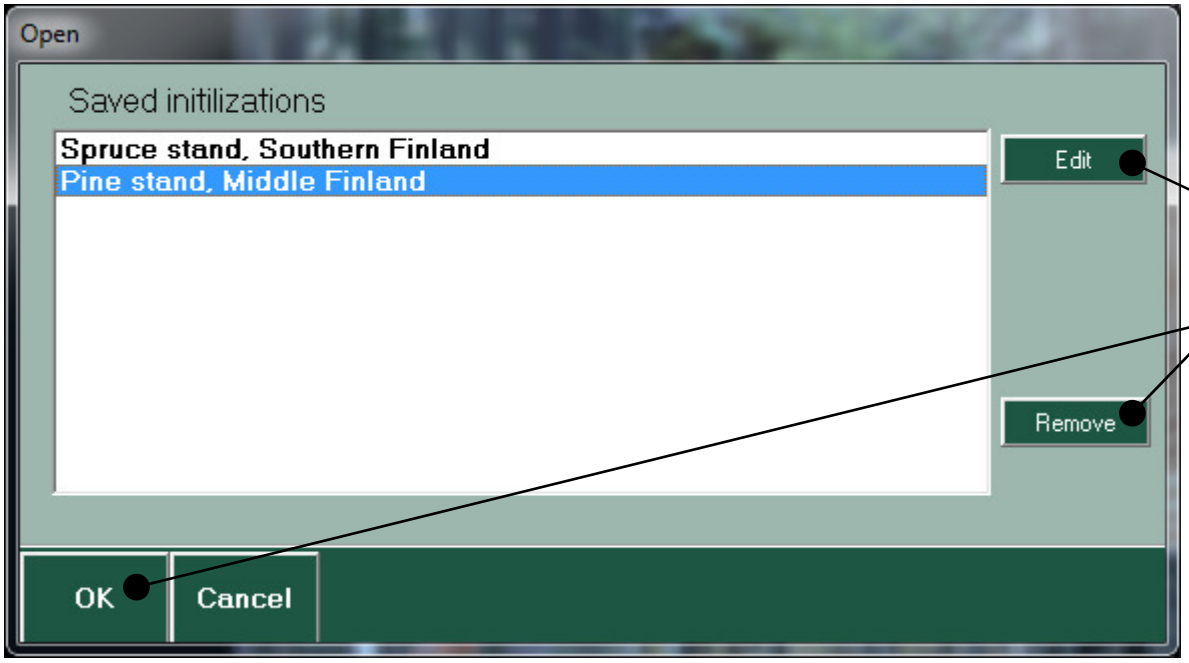
Motti predicts the development of retention trees, and their effect on the dynamics of the regenerated stocking. You cannot apply any treatments to retention trees and they are not included in cutting removals.

Natural regeneration:



1.2. Opening saved initializations

Pick: INITIALIZATION → Open



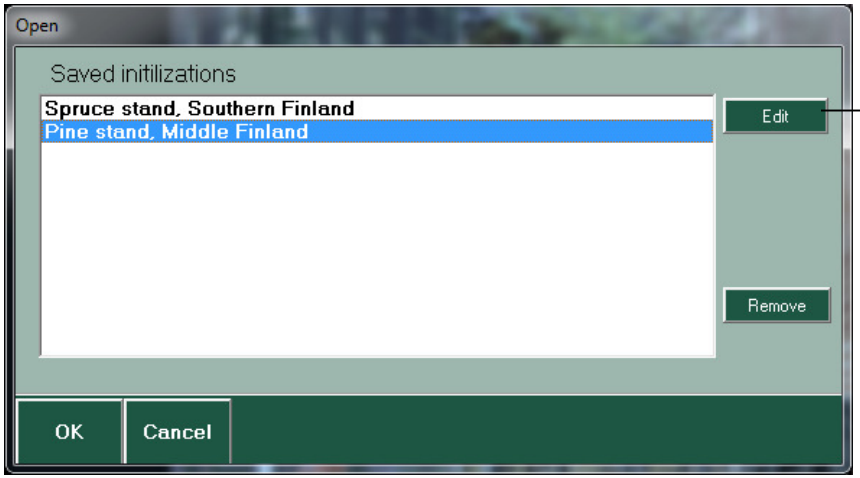
Saved initializations are represented here.

Select a stand –
- To edit it
- To remove it
- For the simulation

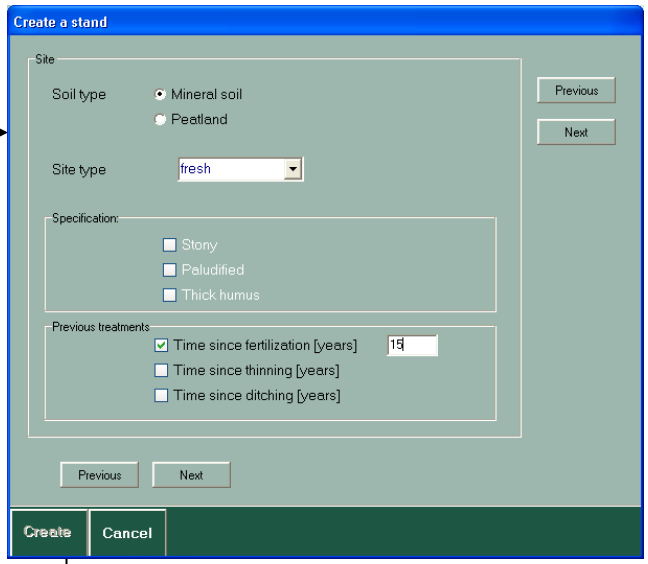
1.2.1 Editing saved initializations

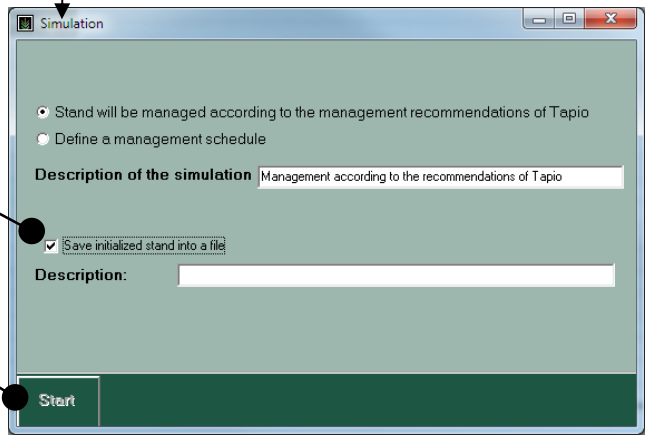
Select: INITILIZATION → Open → select a stand → Edit → *Edit selections* → Create

Select a stand and press ”Edit”-button.



Press Create-button after you have completed the changes.



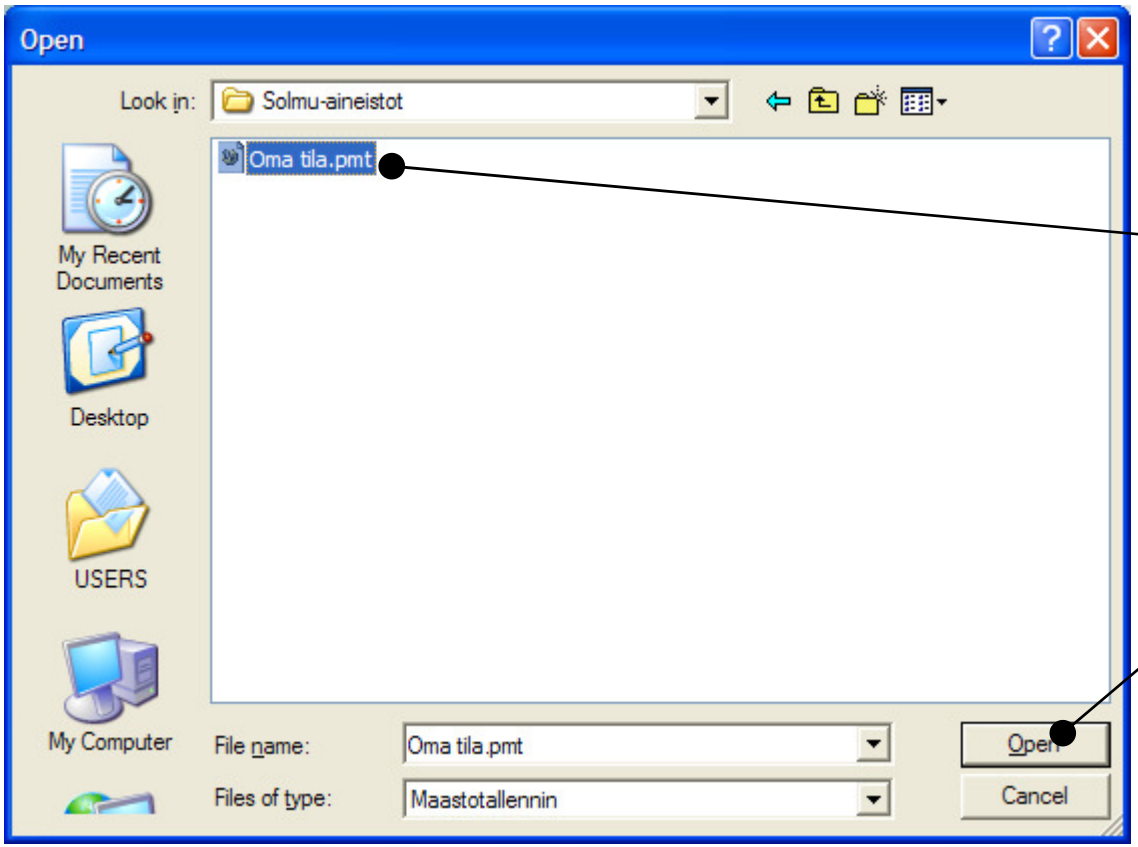

Simulation
Stand will be managed according to the management recommendations of Tapio
Define a management schedule
Description of the simulation
Management according to the recommendations of Tapio
Save initialized stand into a file
Description:
Start

Save edited initialization to a new initialization. (chapter 2.1).

Start simulation!

1.4. Retrieving stand data from forest inventory file

Select: Initialization of stand → Open Solmu-file

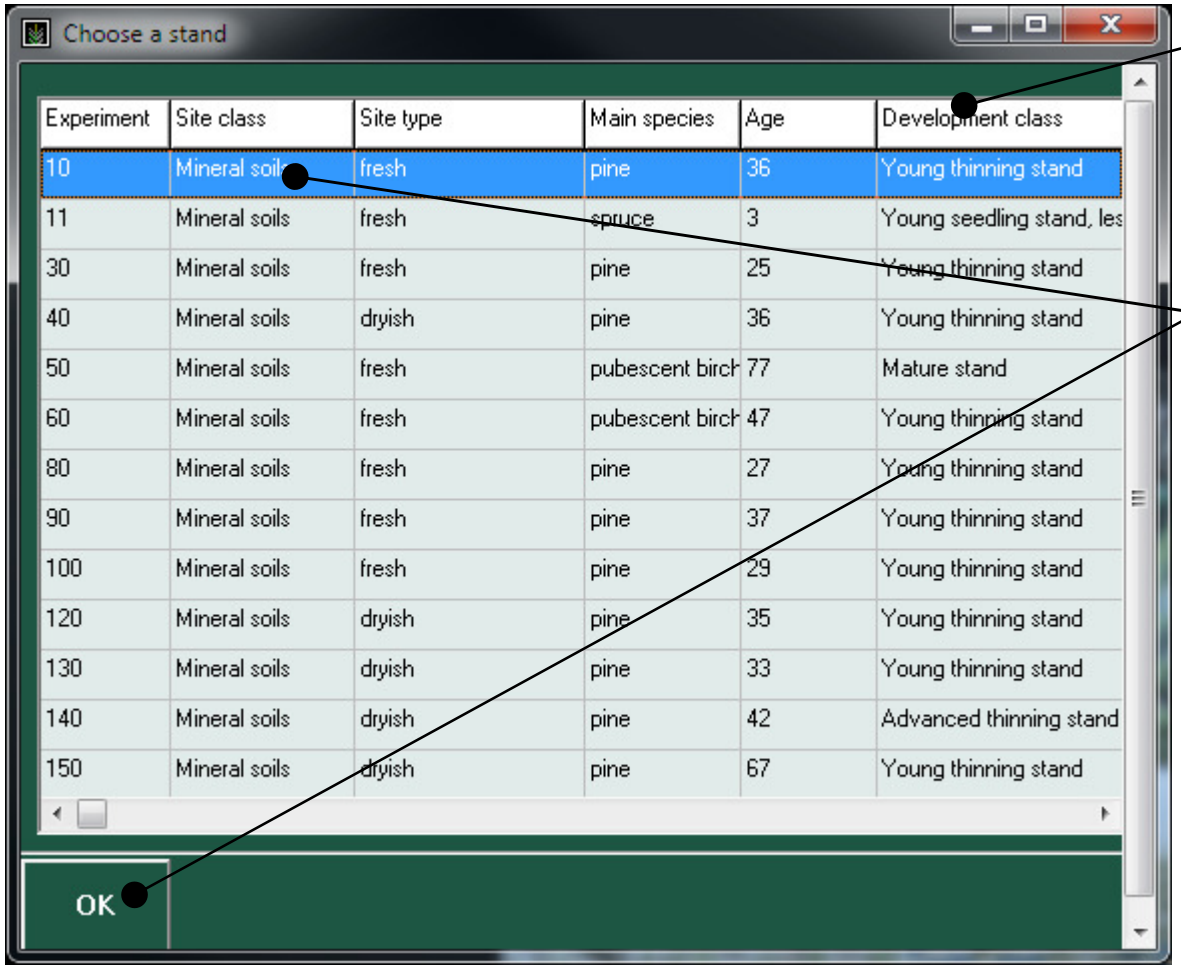


The forest inventory files used in private forestry are usually pmt-formatted

Once the correct file is selected, click "Open" button

1.4. Retrieving stand data from forest inventory file (2/3)

Picking a compartment from the inventory file


Choose a stand
Experiment
Site class
Site type
Main species
Age
Development class
10 Mineral soils fresh pine 36 Young thinning stand
11 Mineral soils fresh spruce 3 Young seedling stand, les
30 Mineral soils fresh pine 25 Young thinning stand
40 Mineral soils dryish pine 36 Young thinning stand
50 Mineral soils fresh pubescent birch 77 Mature stand
60 Mineral soils fresh pubescent birch 47 Young thinning stand
80 Mineral soils fresh pine 27 Young thinning stand
90 Mineral soils fresh pine 37 Young thinning stand
100 Mineral soils fresh pine 29 Young thinning stand
120 Mineral soils dryish pine 35 Young thinning stand
130 Mineral soils dryish pine 33 Young thinning stand
140 Mineral soils dryish pine 42 Advanced thinning stand
150 Mineral soils dryish pine 67 Young thinning stand
OK

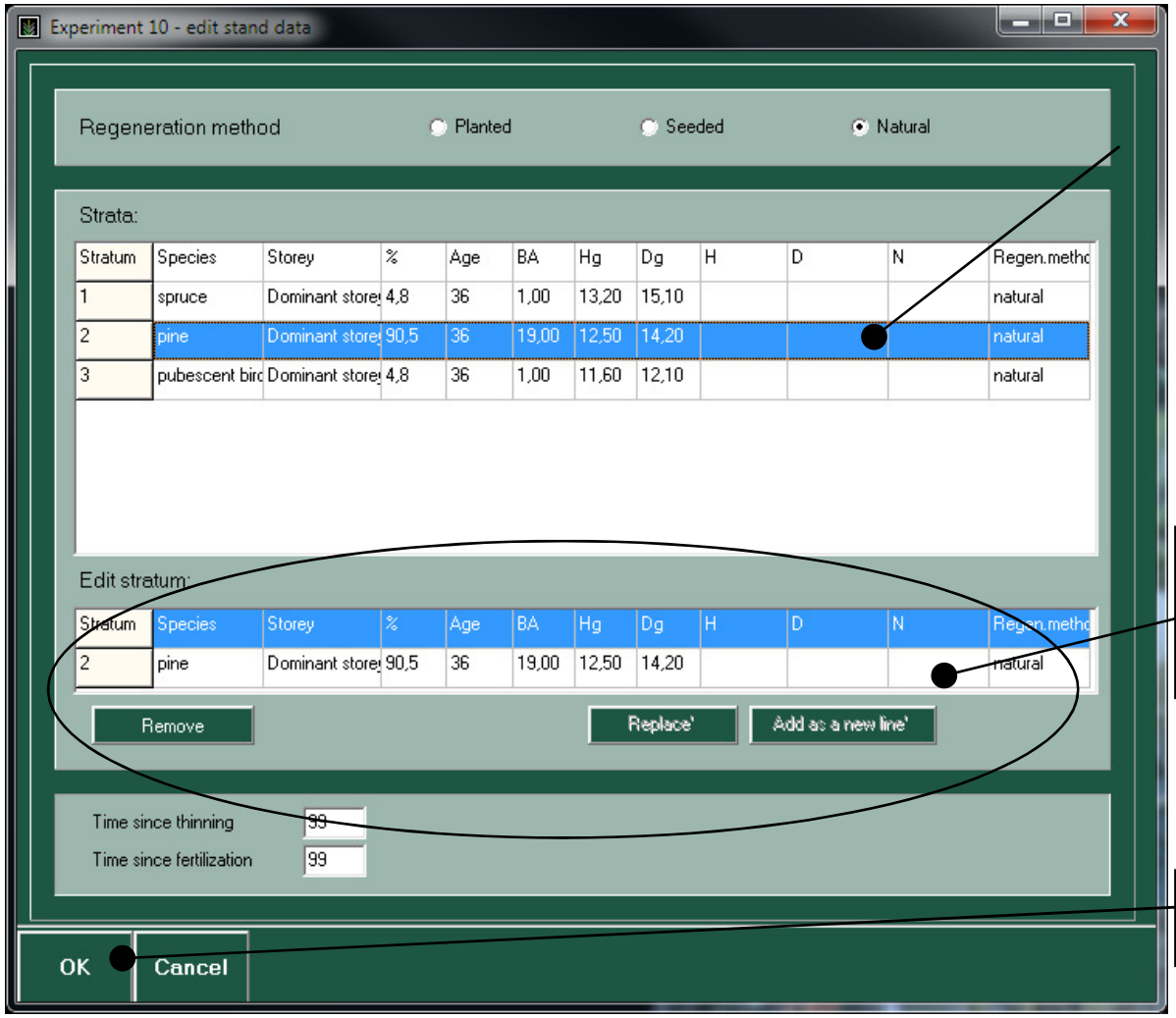
Once you've opened a forest inventory file, all the compartments of that inventory are listed.

Select the compartment you want to simulate, and click OK

ATTN! MOTTI can only simulate compartments with established stocking. If a compartment is an open regeneration area, initialization has to be done manually (see chapter 1.2. (7/7)).

1.4. Retrieving stand data from forest inventory file (3/3)

Manually updating stand data from inventory


Experiment 10 - edit stand data
Regeneration method
Planted
Seeded
Natural
Strata:
Stratum Species Storey % Age BA Hg Dg H D N Regen.metho
1 spruce Dominant store 4,8 36 1,00 13,20 15,10 natural
2 pine Dominant store 90,5 36 19,00 12,50 14,20 natural
3 pubescent birc Dominant store 4,8 36 1,00 11,60 12,10 natural
Edit stratum:
Stratum Species Storey % Age BA Hg Dg H D N Regen.metho
2 pine Dominant store 90,5 36 19,00 12,50 14,20 natural
Remove
Replace'
Add as a new line'
Time since thinning
99
Time since fertilization
99
OK
Cancel

Once you've selected the compartment, all the strata in that stand are listed. Select the stratum you want to update.

The data of the selected stratum are listed here. You can change the data, remove the whole stratum, or add new ones.

When you are ready to proceed, click OK

2.SIMULATION

1. "Automatic" simulation according to the pre-defined management schedule

- Thinning schedule according to the practical management recommendations for private forests of Finland.
- pre-defined criteria for final felling based on stand mean diameter
- default simulation for stands growing on mineral soil site types

2. User-defined step-wise simulation

Management practices:

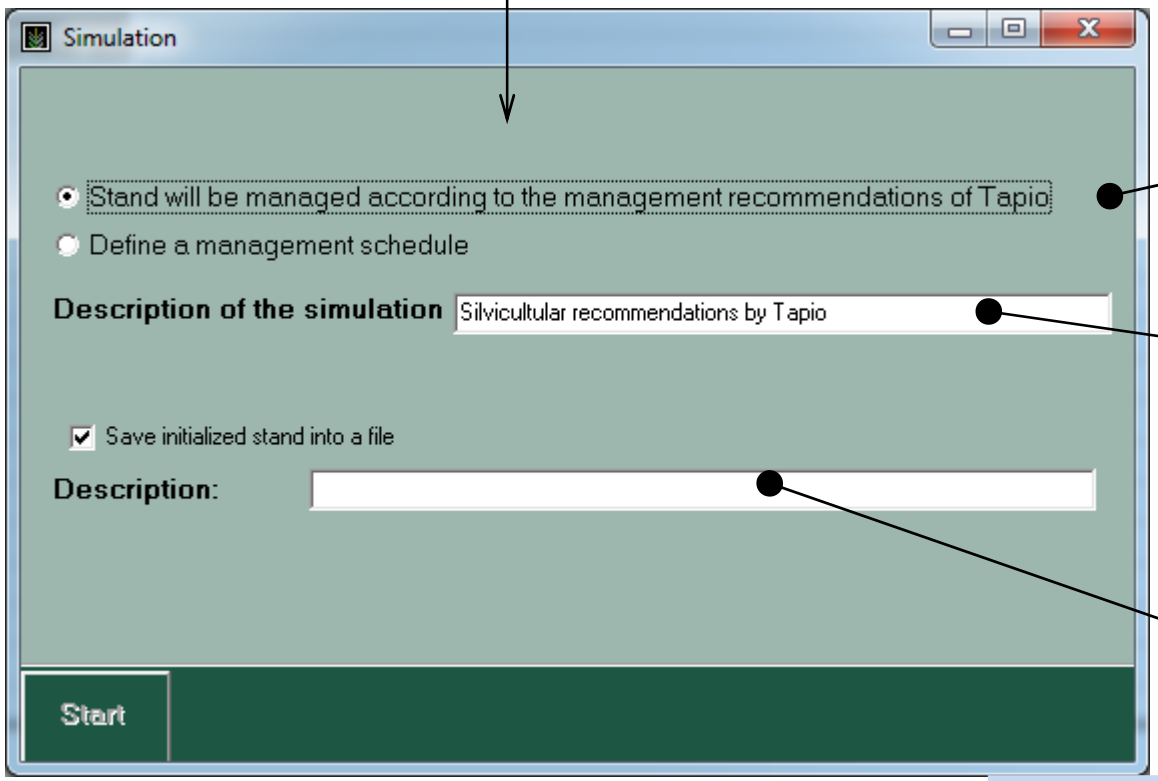
- simulation step-by-step (1-5 years)
- clearing of a sapling stand
- precommercial thinning
- cuttings
  - removal of seed trees
  - commercial thinning
  - final cut
- silvicultural management practices
  - fertilization (on mineral soils)
  - supplementary ditching (on drained peatlands)
  - high pruning

3. Simulation according the user-defined management schedule

- customized management schedule for the whole rotation
  - user-defined thinning thinning program
  - user-defined criteria for the final felling (mean diameter od stand age)

2.1. Selection of a management schedule

In the beginning of the simulation this dialog box will open


Simulation
Stand will be managed according to the management recommendations of Tapio
Define a management schedule
Description of the simulation
Silvicultular recommendations by Tapio
Save initialized stand into a file
Description:
Start

Management schedule according to the practical management recommendations for private forests of Finland (default).
Motti simulates the stand development according to the recommendations of Forestry Development Centre Tapio. If you choose this option, the stand development will be simulated automatically until the final felling. This is the default management option.

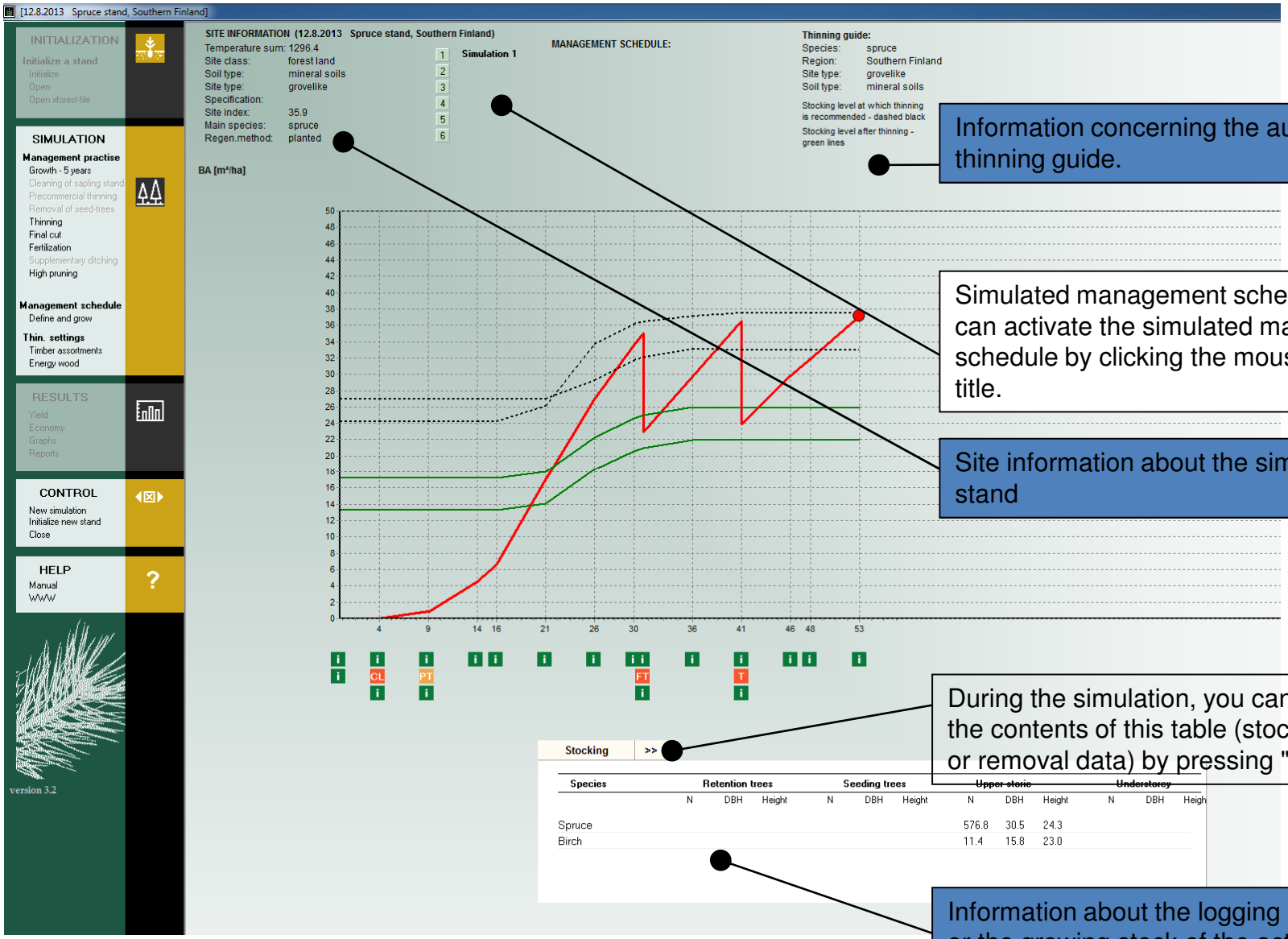
User-defined management schedule
You can name your own management program, and define all the management practices listed below the title "Management practices".

If you have interactively defined the stand data (Initialization => Initialize) you can save the input data, and write the name of the input data in the “Description” -field.

ATTN!
Automatic management schedule is available only for the most common stand types on mineral soils.

Forest management recommendations are documented in the publication of Forestry Development Centre Tapio (2006) : "Hyvän metsänhoidon suositukset". [In Finnish] Stand mean diameter is applied as a criterion for the final felling.

2.2 Main view of the stand simulation (1/3)



Information concerning the automatic thinning guide.

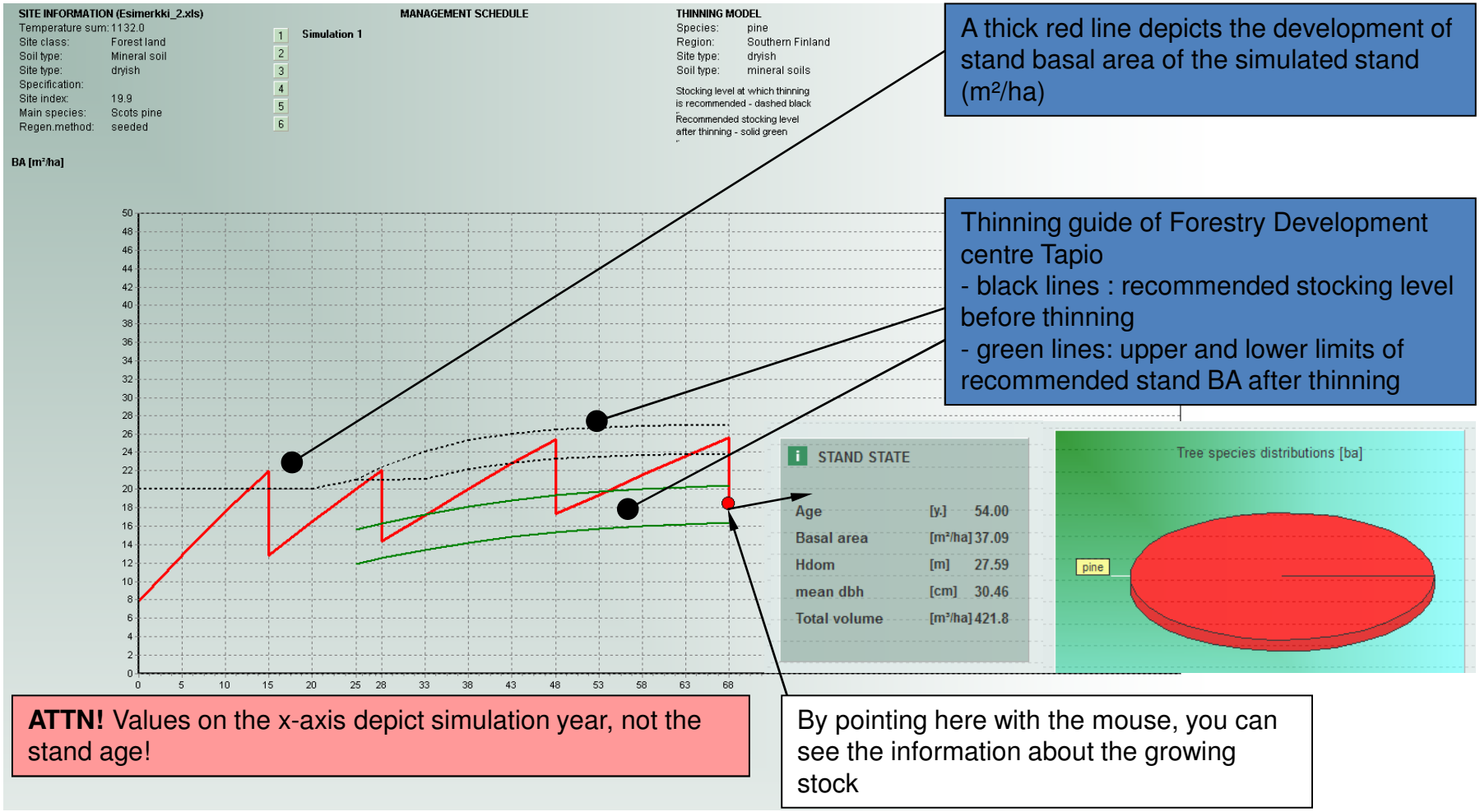
Simulated management schedules. You can activate the simulated management schedule by clicking the mouse over the title.

Site information about the simulated stand

During the simulation, you can change the contents of this table (stocking data or removal data) by pressing ">>"-button

Information about the logging removals or the growing stock of the active (or current) simulation are shown here

2.2 Main view of the stand simulation (2.3)



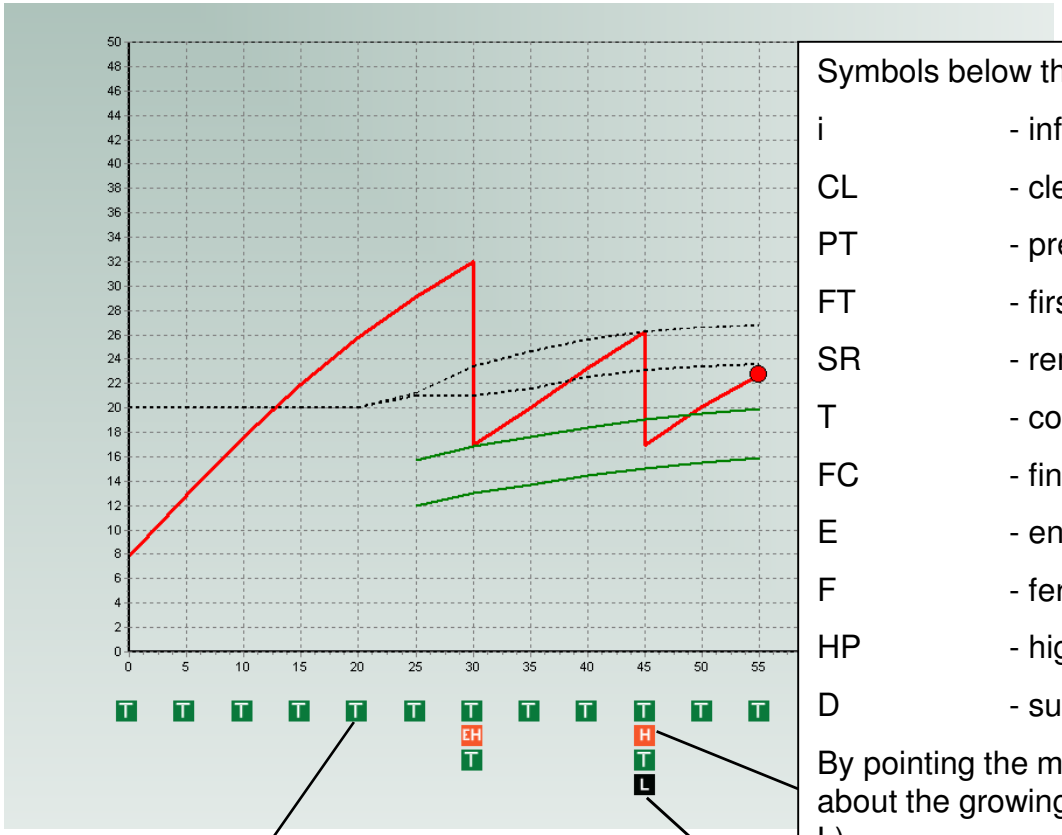
A thick red line depicts the development of stand basal area of the simulated stand (m^2/ha)

Thinning guide of Forestry Development centre Tapio
- black lines : recommended stocking level before thinning
- green lines: upper and lower limits of recommended stand BA after thinning

ATTN! Values on the x-axis depict simulation year, not the stand age!

By pointing here with the mouse, you can see the information about the growing stock

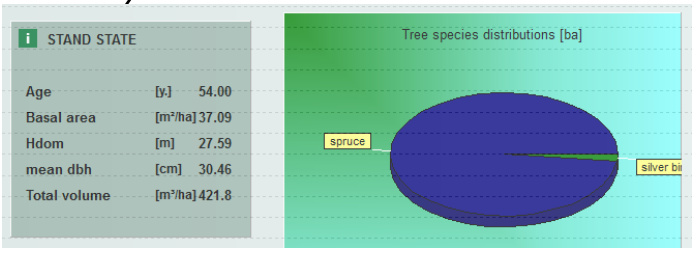
2.2 Main view of the stand simulation (3.3)

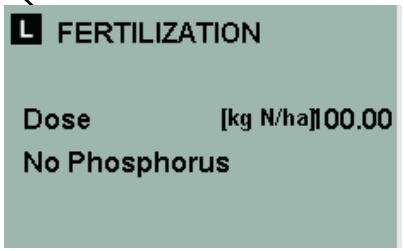


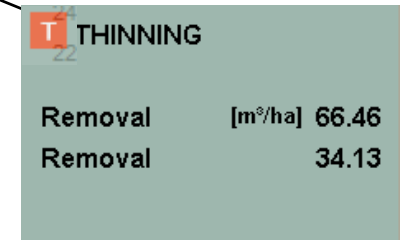
Symbols below the x-axis

i	- information about the growing stock
CL	- clearing of a sapling stand
PT	- precommercial thinning
FT	- first commercial thinning
SR	- removal of the seed trees
T	- commercial thinning
FC	- final felling
E	- energy wood thinning
F	- fertilization (on mineral soils)
HP	- high pruning
D	- supplementary ditching (on peatland forests)

By pointing the mouse over the symbol you can see the information about the growing stock (T) or management practices (TH, EH, H, P, L)

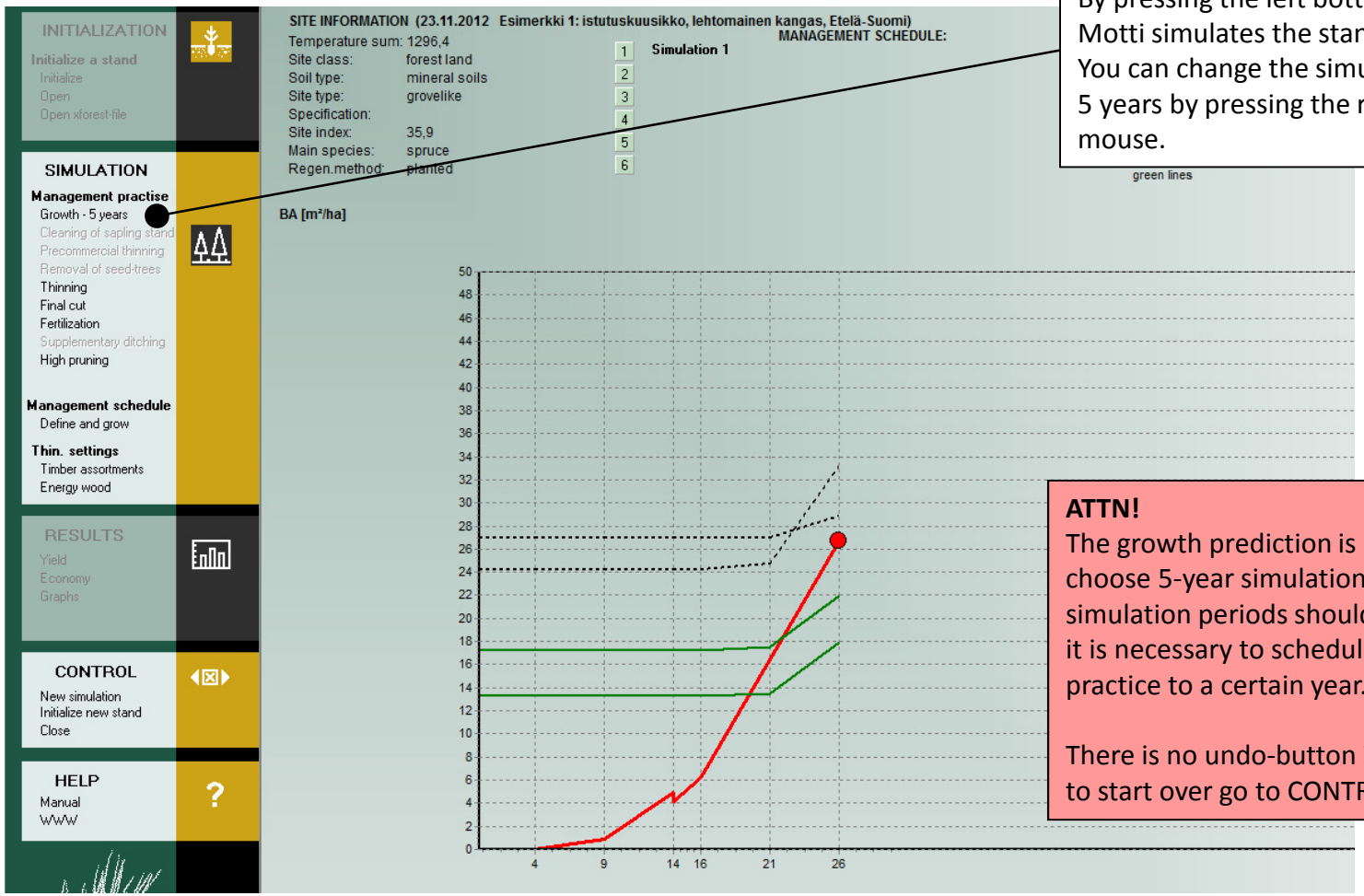






2.2. Stand simulation

Choose: Management practice → Growth - 5 year



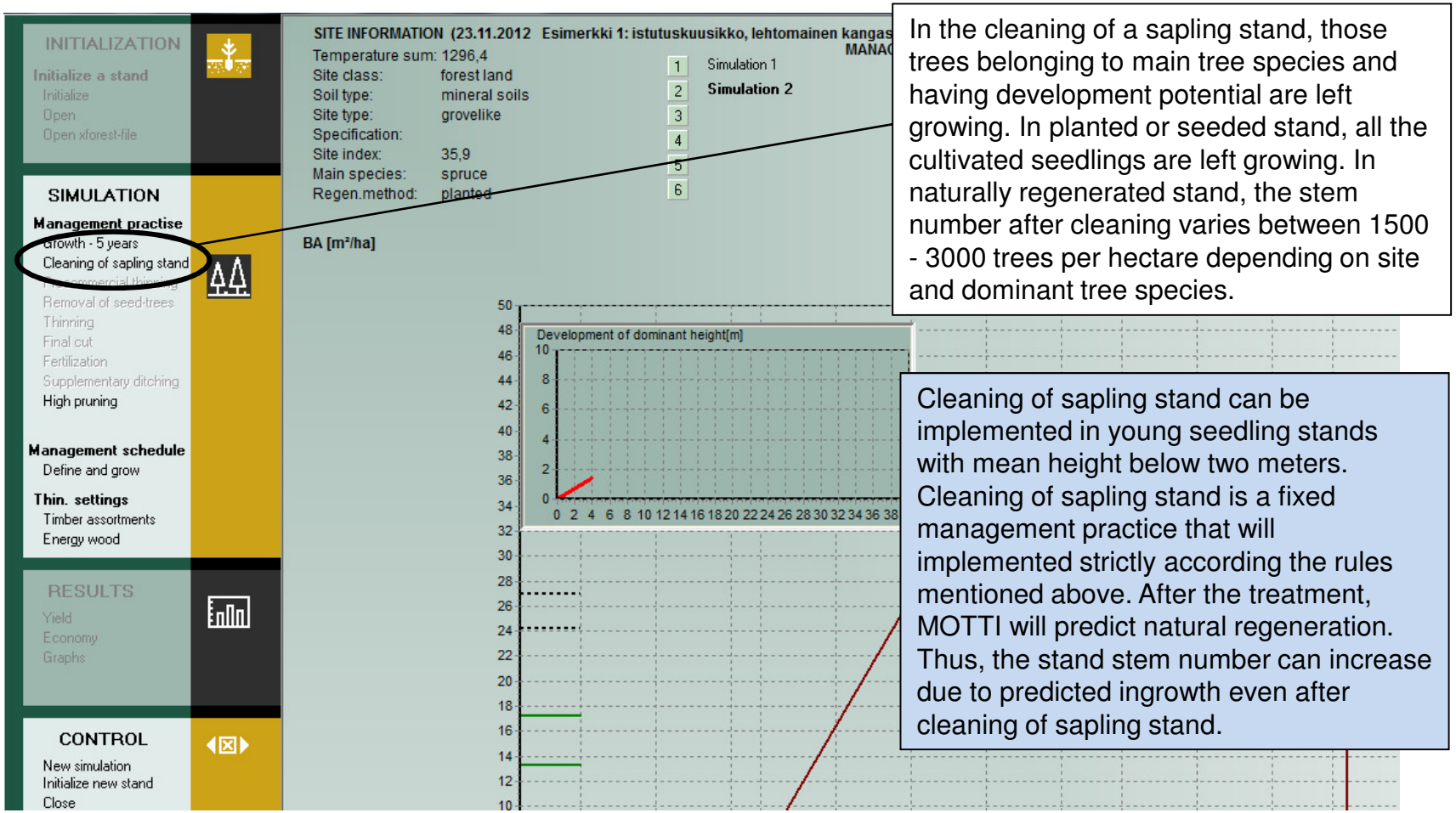
By pressing the left bottom of the mouse Motti simulates the stand growth for 5 years. You can change the simulation step from 1 to 5 years by pressing the right bottom of the mouse.

ATTN!
The growth prediction is most reliable, if you choose 5-year simulation step. Shorter simulation periods should be used only, when it is necessary to schedule the management practice to a certain year.

There is no undo-button in Motti. If you want to start over go to CONTROL->New simulation.

2.3. Cleaning of sapling stand

Choose: Management practice → Cleaning of sapling stand

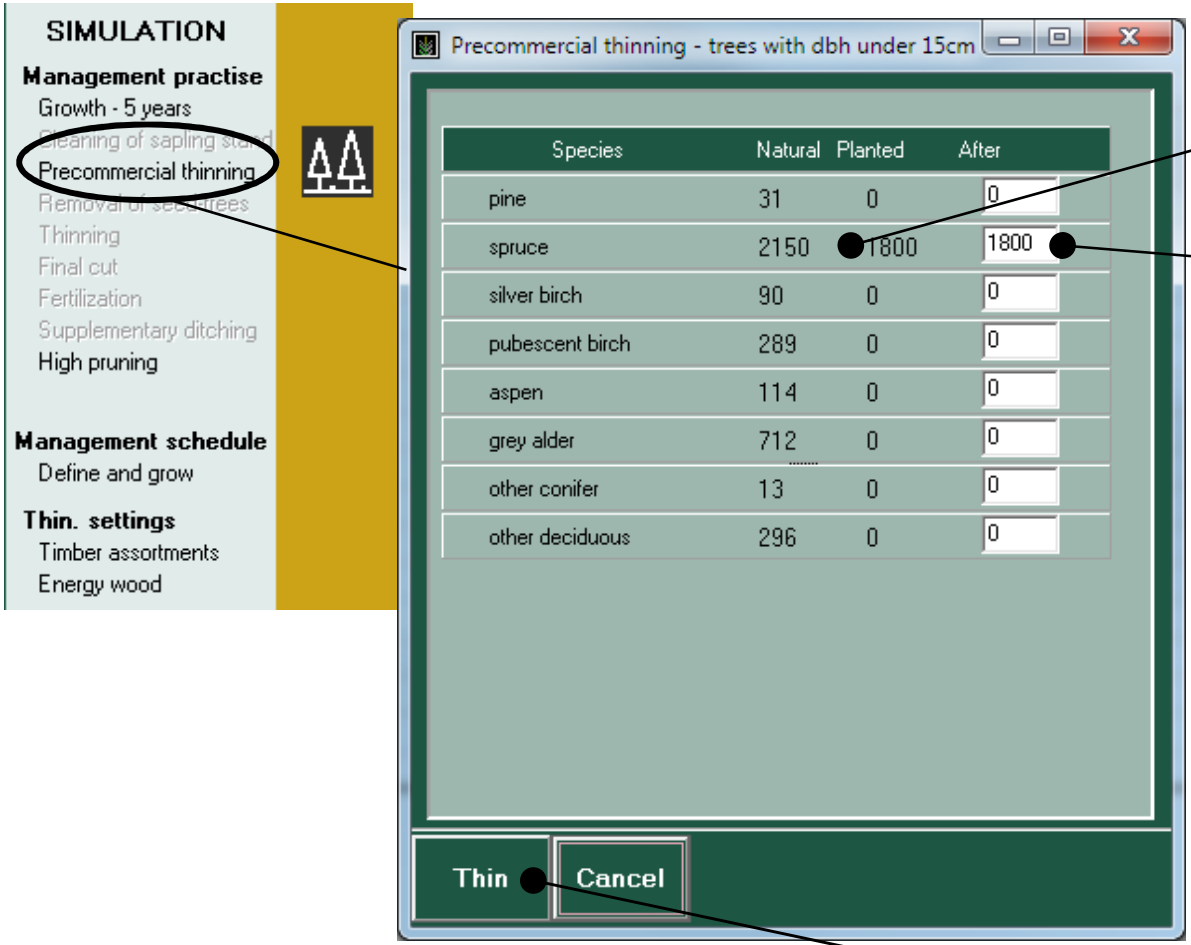


In the cleaning of a sapling stand, those trees belonging to main tree species and having development potential are left growing. In planted or seeded stand, all the cultivated seedlings are left growing. In naturally regenerated stand, the stem number after cleaning varies between 1500 - 3000 trees per hectare depending on site and dominant tree species.

Cleaning of sapling stand can be implemented in young seedling stands with mean height below two meters. Cleaning of sapling stand is a fixed management practice that will implemented strictly according the rules mentioned above. After the treatment, MOTTI will predict natural regeneration. Thus, the stand stem number can increase due to predicted ingrowth even after cleaning of sapling stand.

2.4. Precommercial thinning

Choose: Management practice → Precommercial thinning



Motti shows the current stem numbers by tree species.

Write here stem numbers by tree species after precommercial thinning.

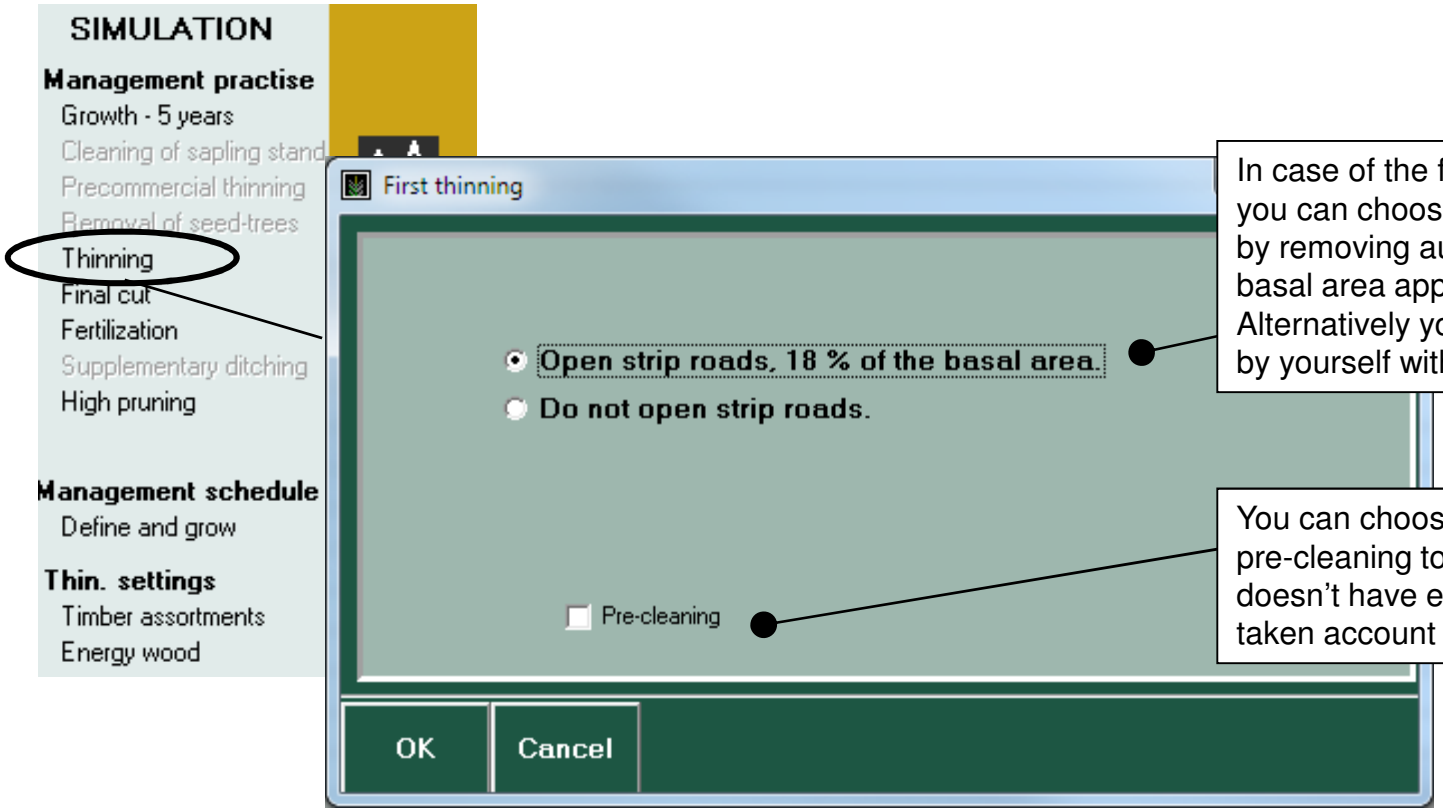
Precommercial thinning can be carried out in stands with dominant height between 2 - 8 meters.

In precommercial thinning, seedlings having no development potential are removed first. Then if necessary, seedlings having development potential are removed until predefined density (trees/ha) is met.

Press “Thin"-button to proceed.

2.5. Commercial thinning

Choose: Management practice → Thinning

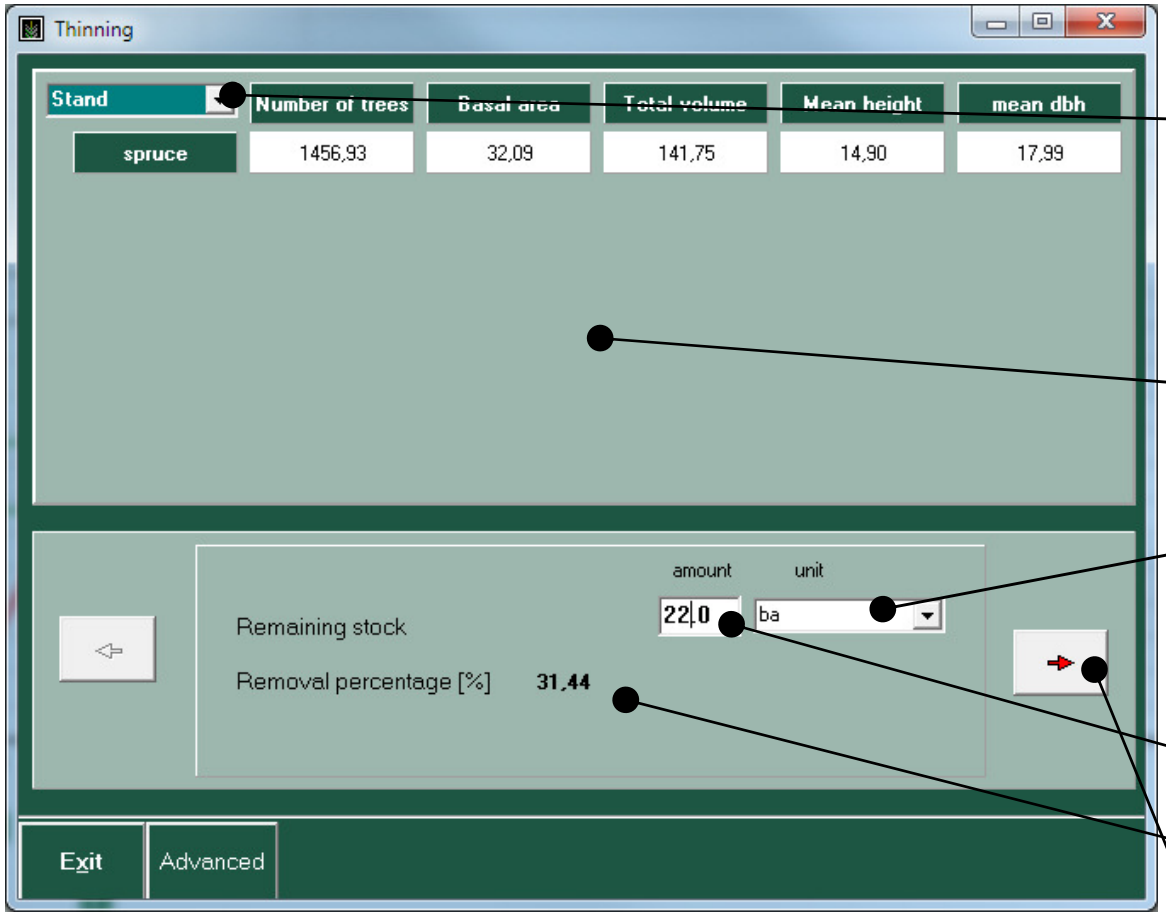


In case of the first commercial thinning you can choose, if strip roads are made by removing automatically 18% of stand basal area applying systematic thinning. Alternatively you can define the thinning by yourself without opening the strip roads

You can choose whether or not include pre-cleaning to the thinning. Pre-cleaning doesn't have effect on tree growth, but it is taken account as an additional cost.

If the simulation starts from the regeneration, the history of the stand is recorded automatically. On the other hand, when simulating established stands, MOTTI concludes based on the stand characteristics and treatment history, whether the thinning in question is the first commercial thinning.

2.5. Commercial thinning (2/9)



First, choose the tree storey to be thinned
- single-storey stand: choose stand
- in multi-storied stand you can define the tree storey to be thinned
  - dominant storey
  - under-storey
  - over-storey

In this field you can see the information of the growing stock by tree species before thinning. If you have asked Motti to open the strip roads, the figures depict the situation after opening the strip roads

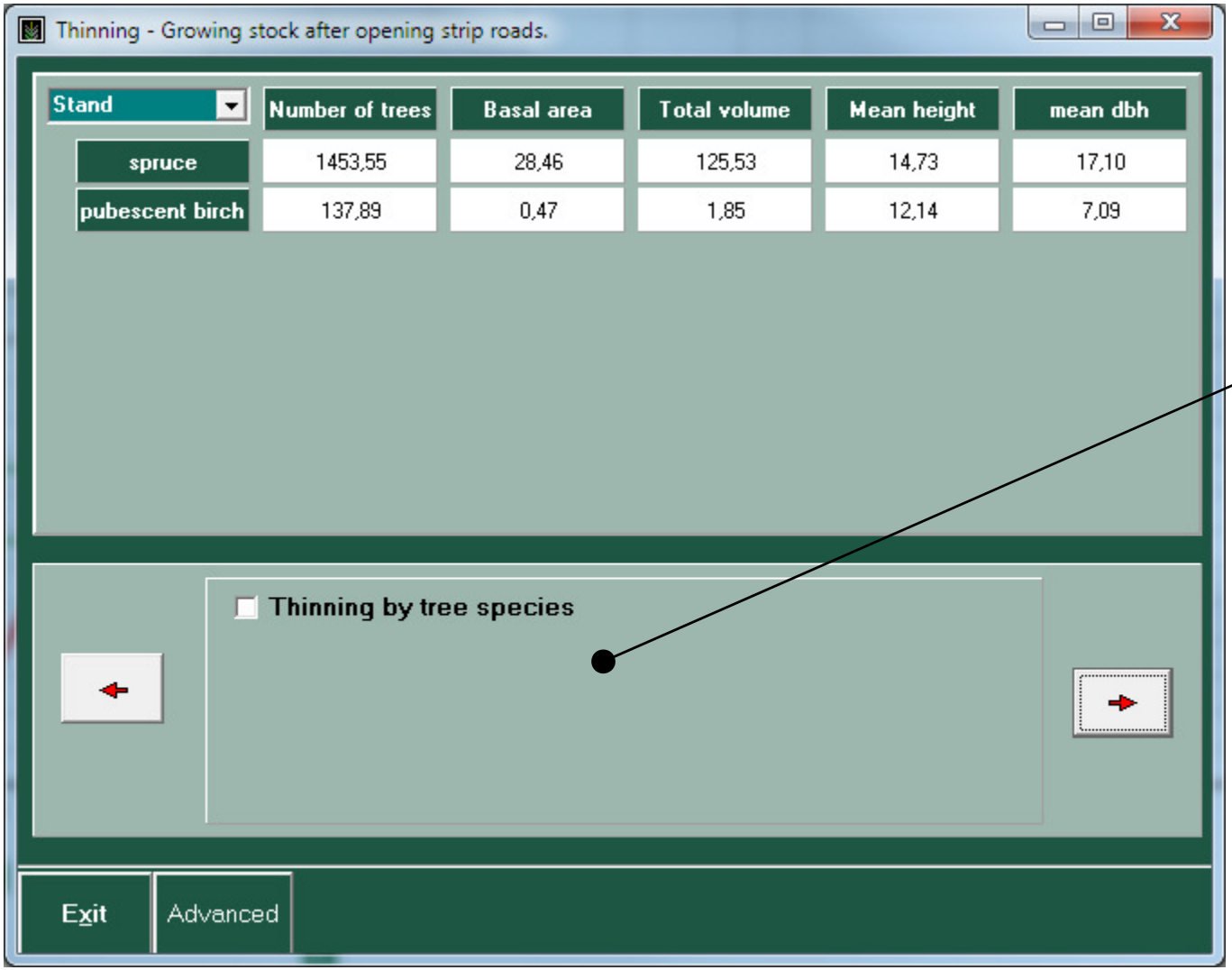
Define the amount of the growing stock after thinning
1) Choose the criteria for the amount of the growing stock after thinning: stem number, basal area or volume

2) Define the amount of growing stock

Motti shows the relative removal (% of the growing stock)

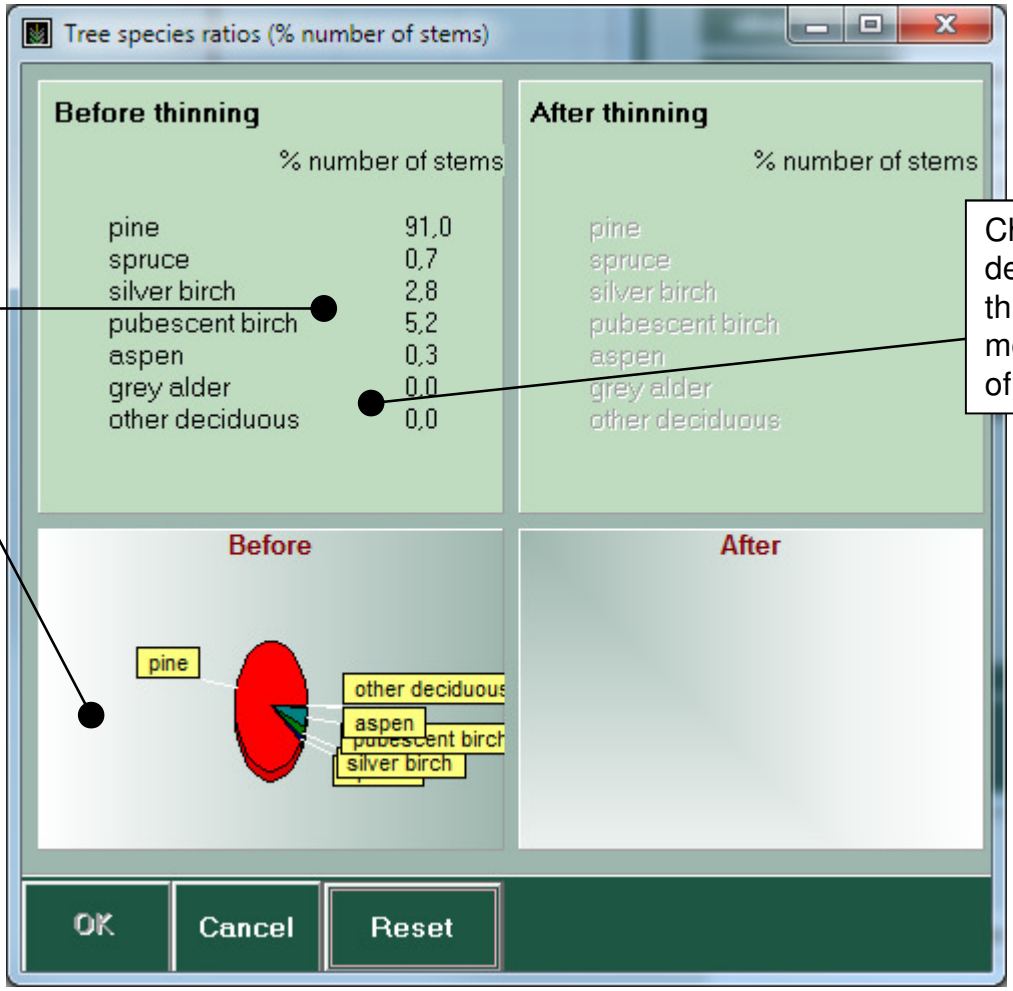
You can move to the next screen by pressing the red arrow button.

2.5. Commercial thinning (3/9)



In mixed stand you can define thinning by tree species.

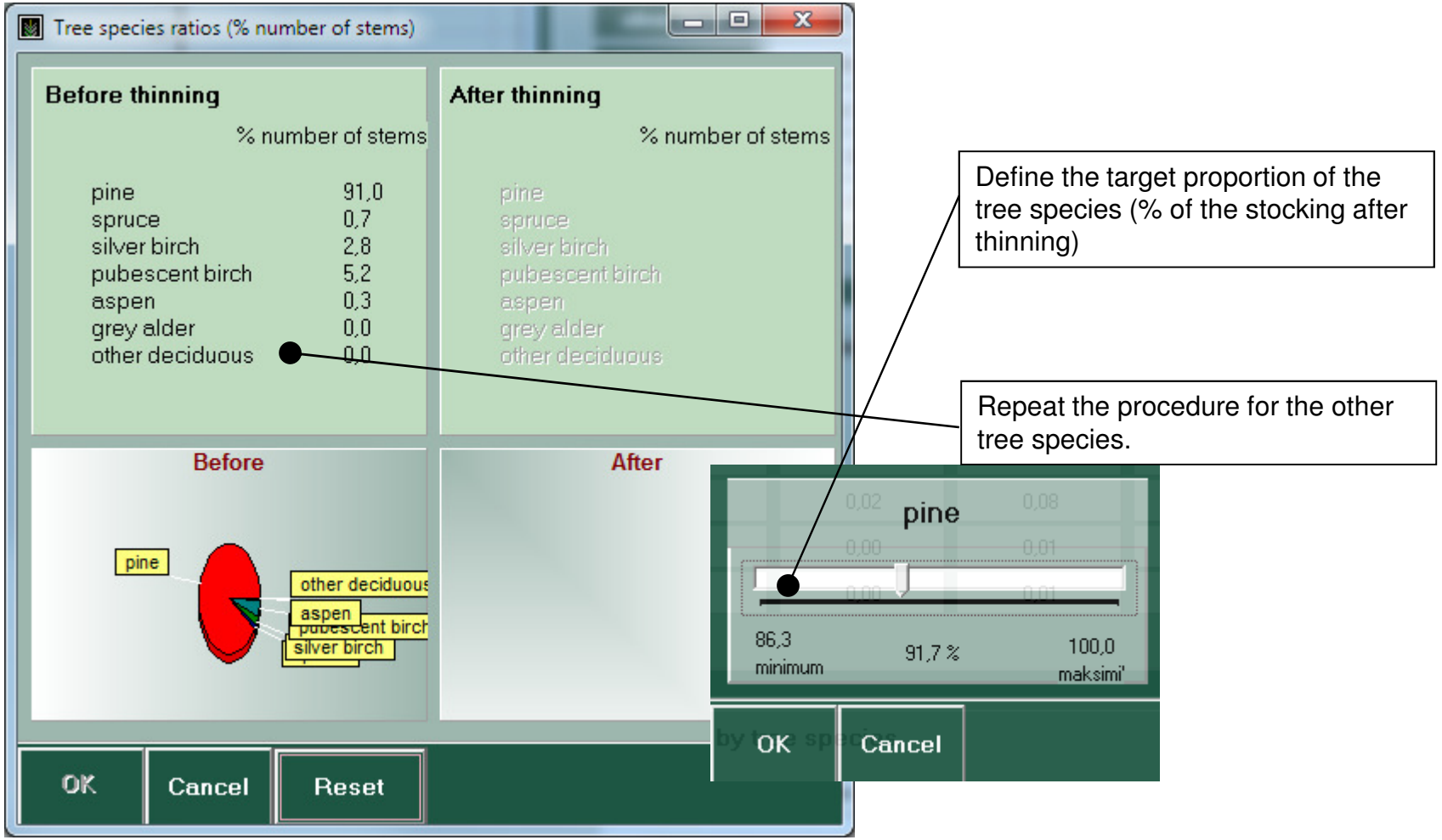
2.5. Commercial thinning (4/9)



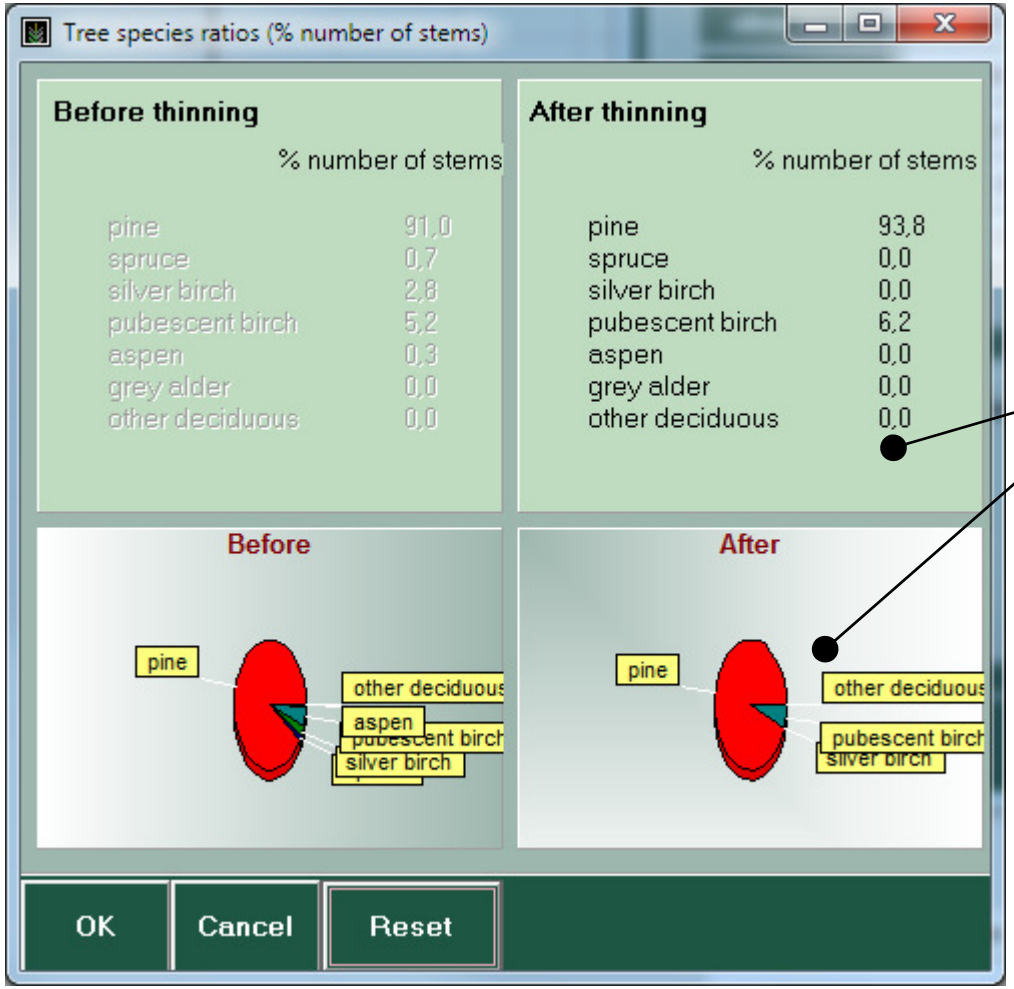
Proportions of tree species before thinning

Choose the tree species to define it's proportion after thinning (click the left mouse button on the name of the tree species)

2.5. Commercial thinning (5/9)

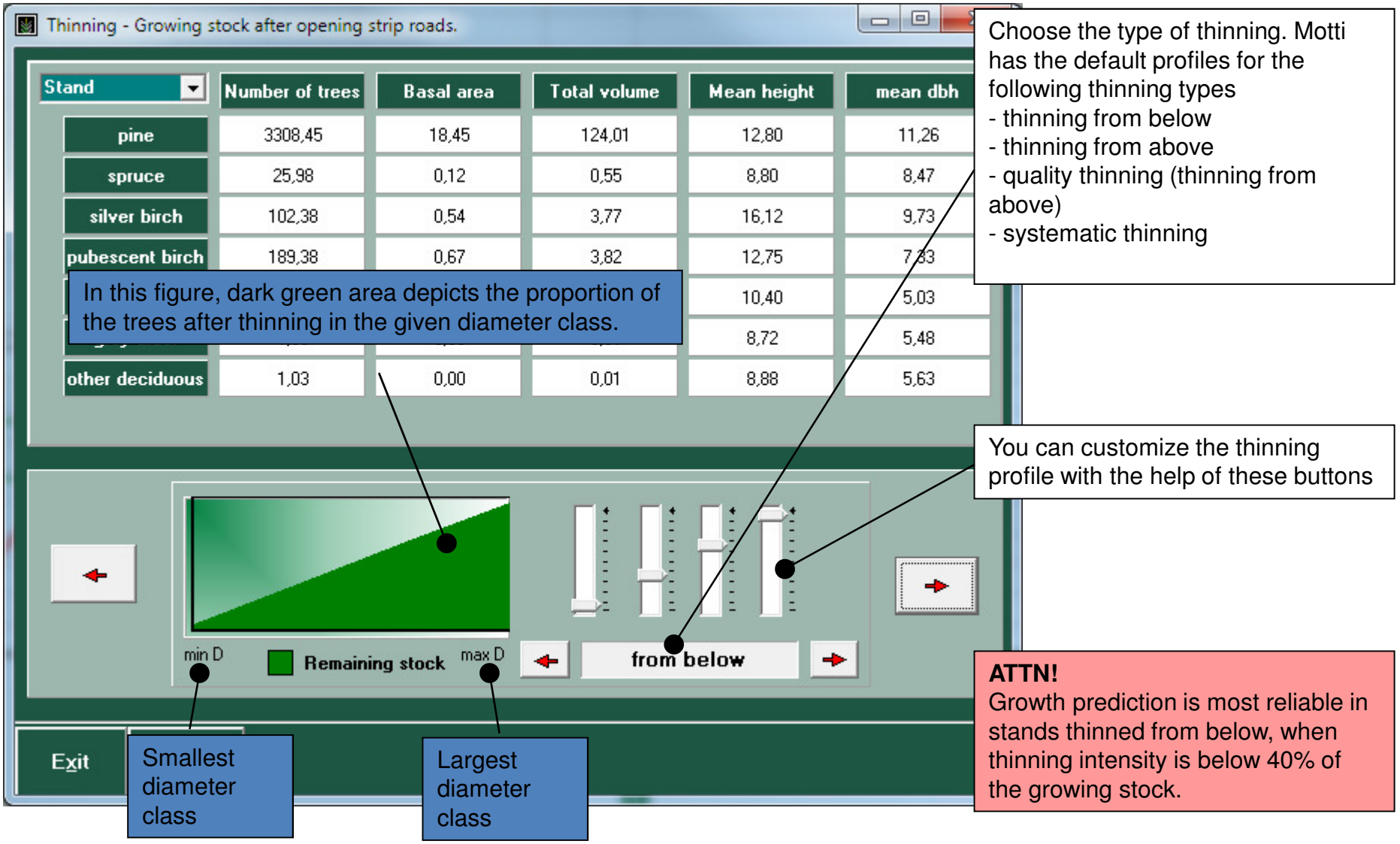


2.5. Commercial thinning (6/9)

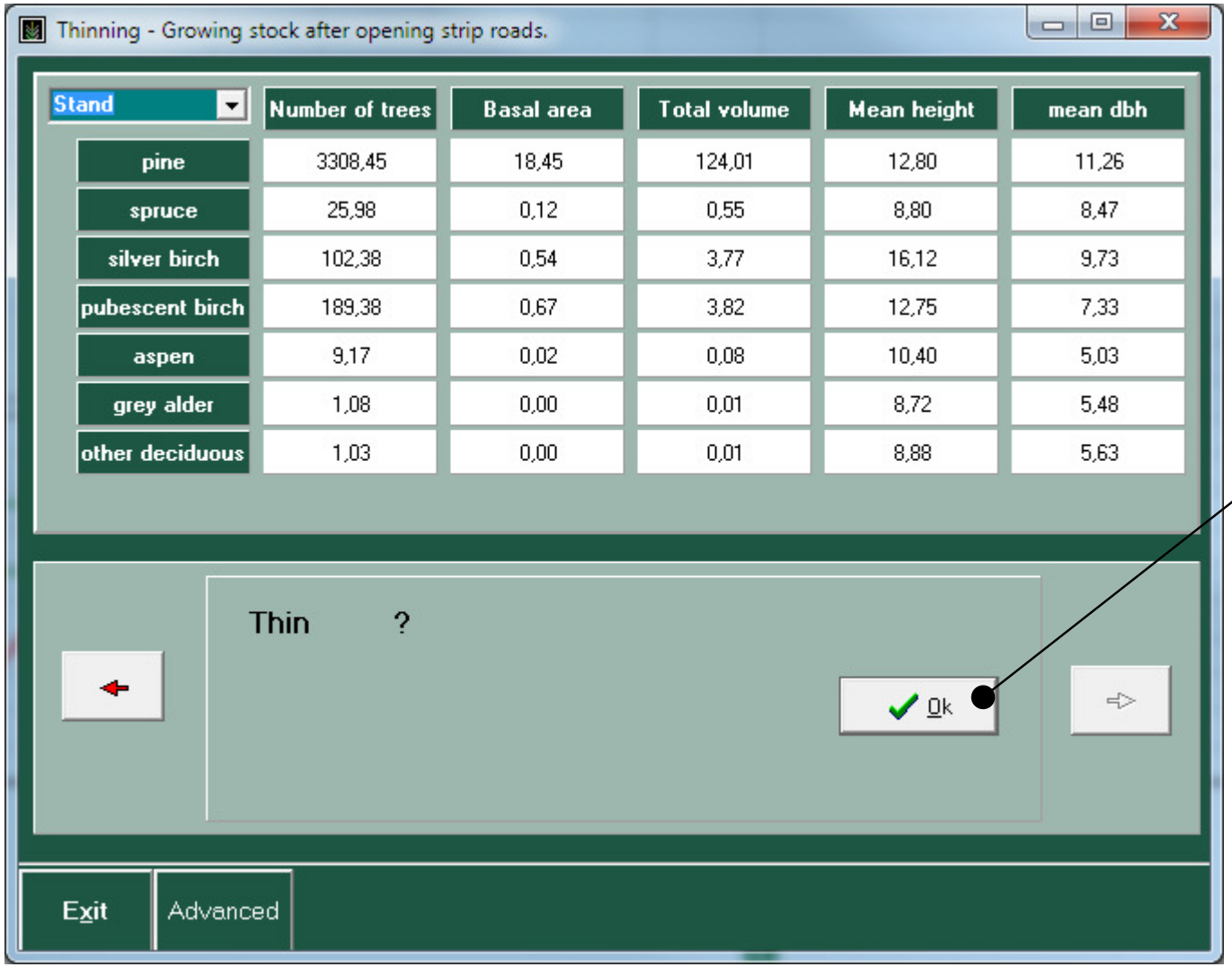


After defining the target proportions for the tree species, Motti displays the proportions of tree species after thinning

2.5. Commercial thinning (7/9)


Thinning - Growing stock after opening strip roads.
Stand
Number of trees
Basal area
Total volume
Mean height
mean dbh
pine 3308,45 18,45 124,01 12,80 11,26
spruce 25,98 0,12 0,55 8,80 8,47
silver birch 102,38 0,54 3,77 16,12 9,73
pubescent birch 189,38 0,67 3,82 12,75 7,33
10,40 5,03
8,72 5,48
other deciduous 1,03 0,00 0,01 8,88 5,63
In this figure, dark green area depicts the proportion of the trees after thinning in the given diameter class.
Choose the type of thinning. Motti has the default profiles for the following thinning types
- thinning from below
- thinning from above
- quality thinning (thinning from above)
- systematic thinning
You can customize the thinning profile with the help of these buttons
min D
Remaining stock
max D
from below
Exit
Smallest diameter class
Largest diameter class
ATTN!
Growth prediction is most reliable in stands thinned from below, when thinning intensity is below 40% of the growing stock.

2.5. Commercial thinning (8/9)



Accept the thinning by pressing "OK"-button.

2.5. Commercial thinning (9/9)

Information of the growing stock after thinning will be displayed in this view.

You can proceed with thinning by pressing "Continue thinning"-button, or complete the procedure by pressing "Ok"-button.

2.7. Fertilization

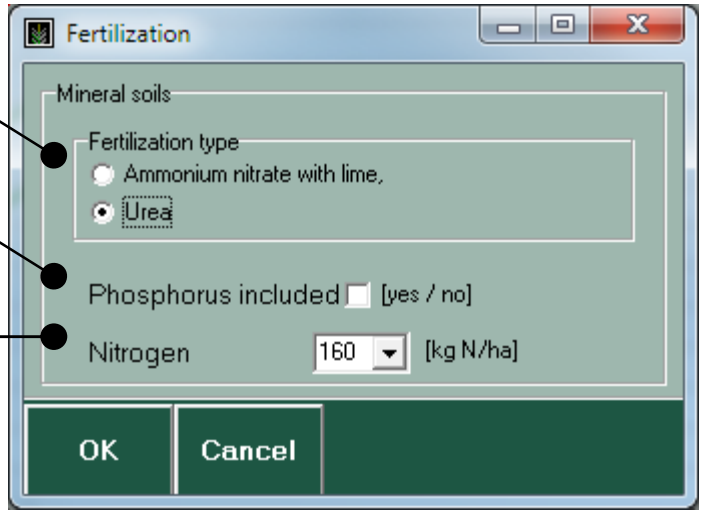
Choose: Management practise → Fertilization

Mineral soils →

Select fertilization type

Select if you want to included phosphorus

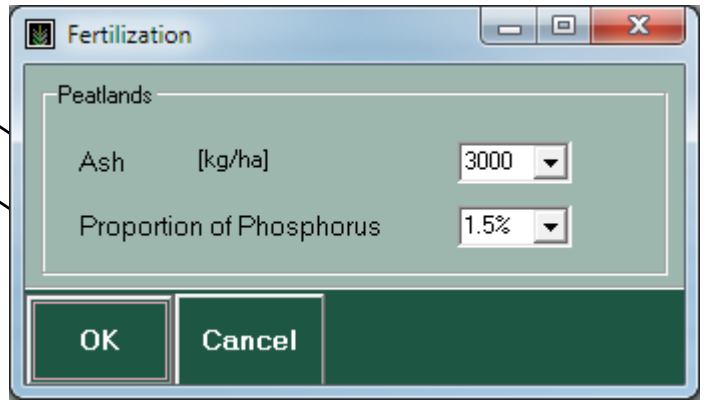
Select the fertilization dose by selecting the amount of pure nitrogen (kg N/ha).



Peatlands →

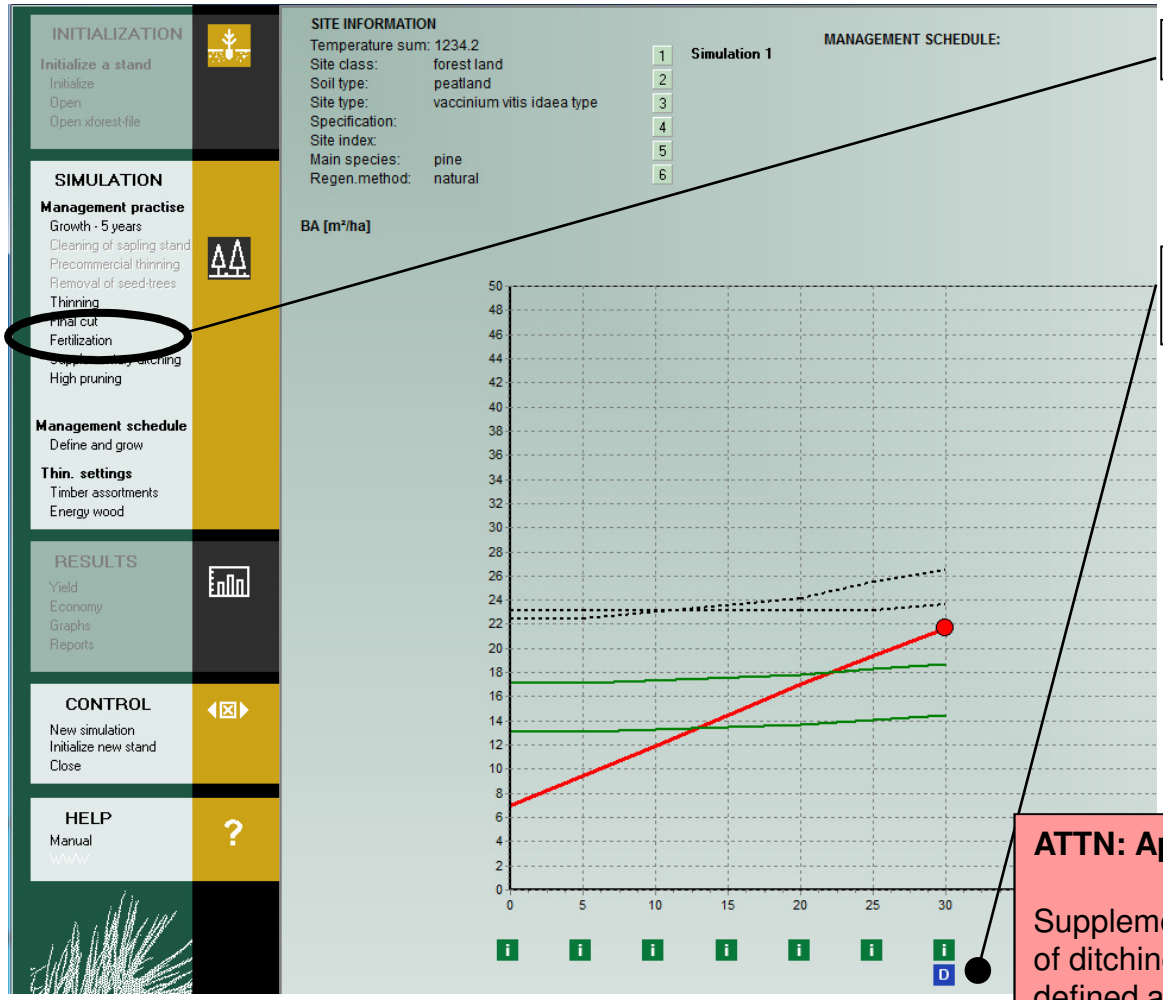
Select the amount of ash (kg/ha)

Select the proportion of Phosphorus.



2.8. Supplementary ditching (=Ditch network maintenance)

Choose: Management practice → Supplementary ditching



Click "Supplementary ditching"

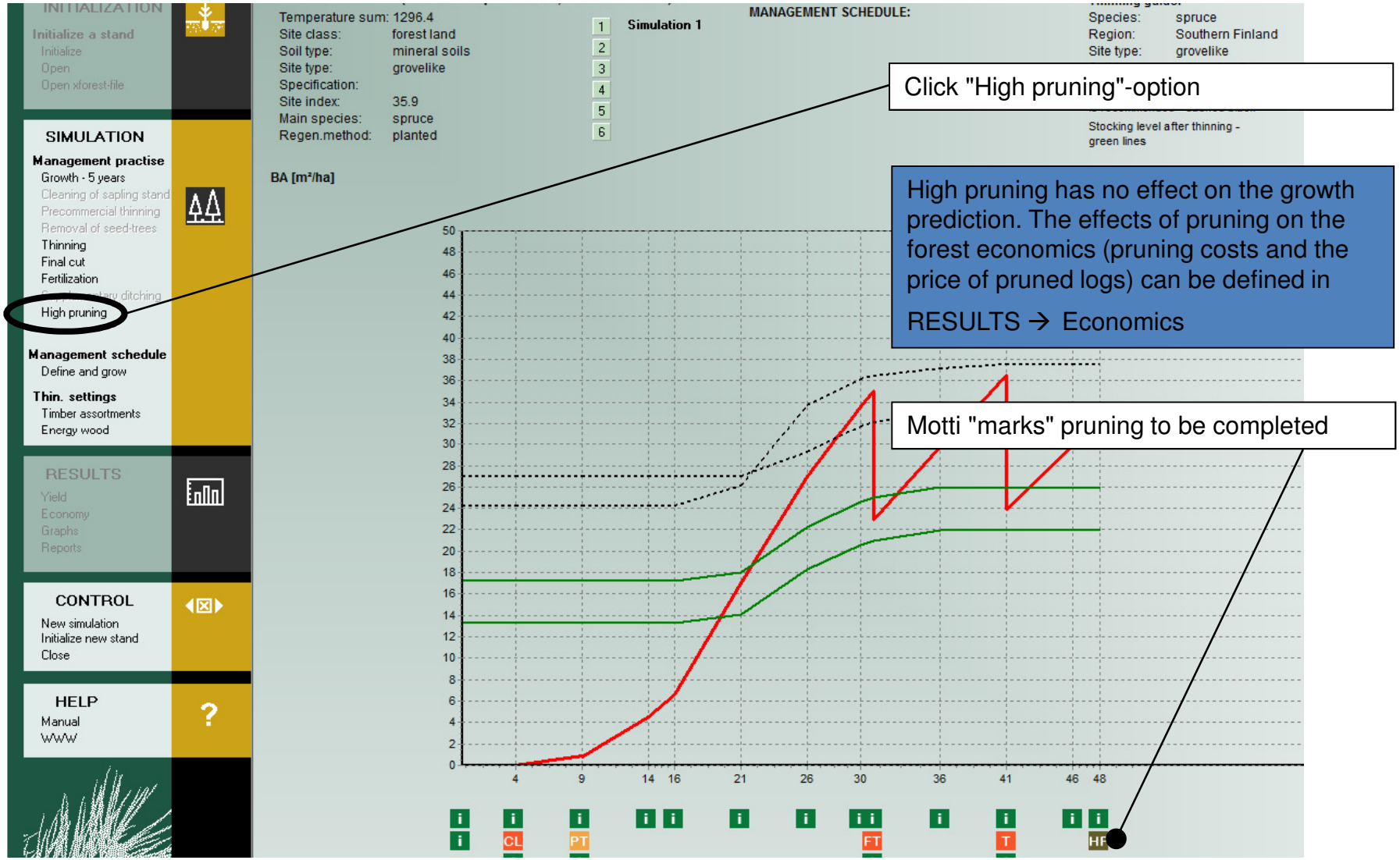
Motti "marks" supplementary ditching to be completed

ATTN: Applicable only on drained peatland sites!

Supplementary ditching affects tree growth. The effects of ditching on the forests economics (costs) can be defined after the simulation in
RESULTS → Economics

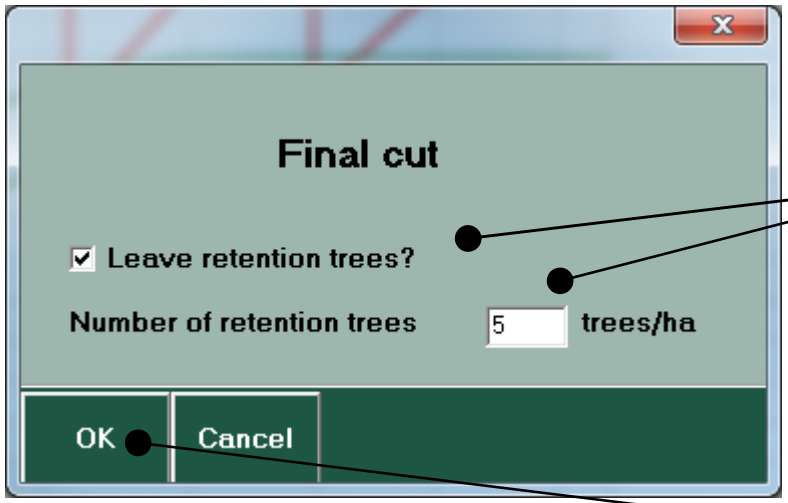
2.9. High pruning

Choose: Management practice → High pruning



2.9. Final felling

Choose: Management practice → Final cut



You can define the number of retention trees (trees per hectare)

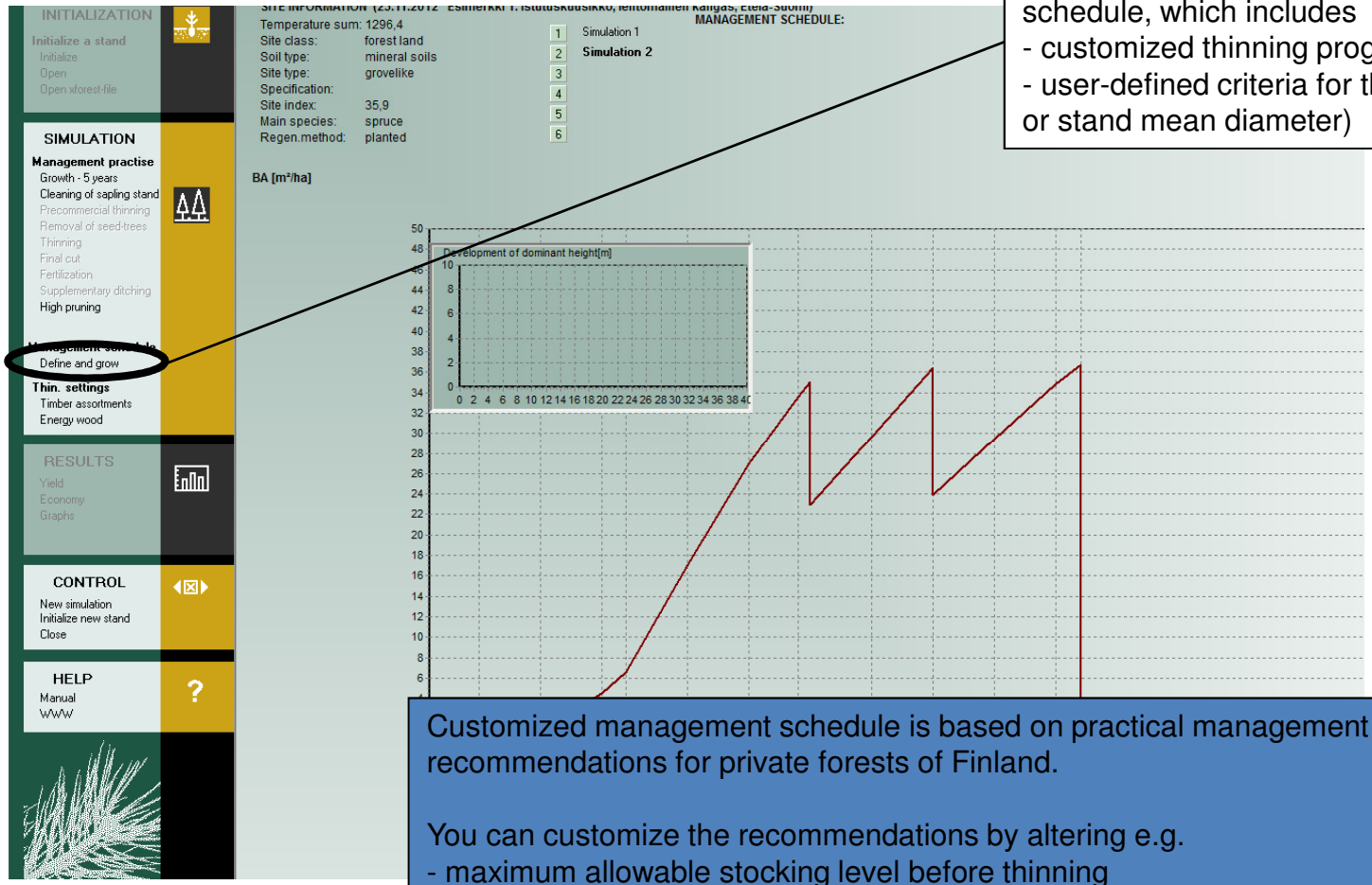
To complete the procedure, press "OK"-button

Motti has an automatic procedure in the selection of the retention trees. Tree species to be left as retention trees are favoured in the following order: aspen, other deciduous trees, Scots pine , Norway spruce.

For each tree species, retention trees are selected evenly from size distribution. This selection mimics the procedure, in which the retention trees are left in tree groups.

2.10. Customized management schedule (1/4)

Choose: management schedule → Define and grow

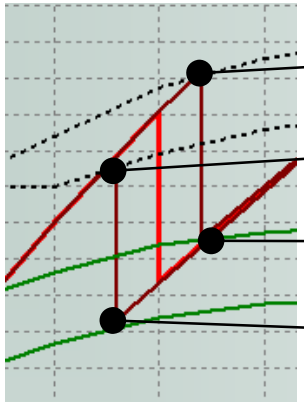


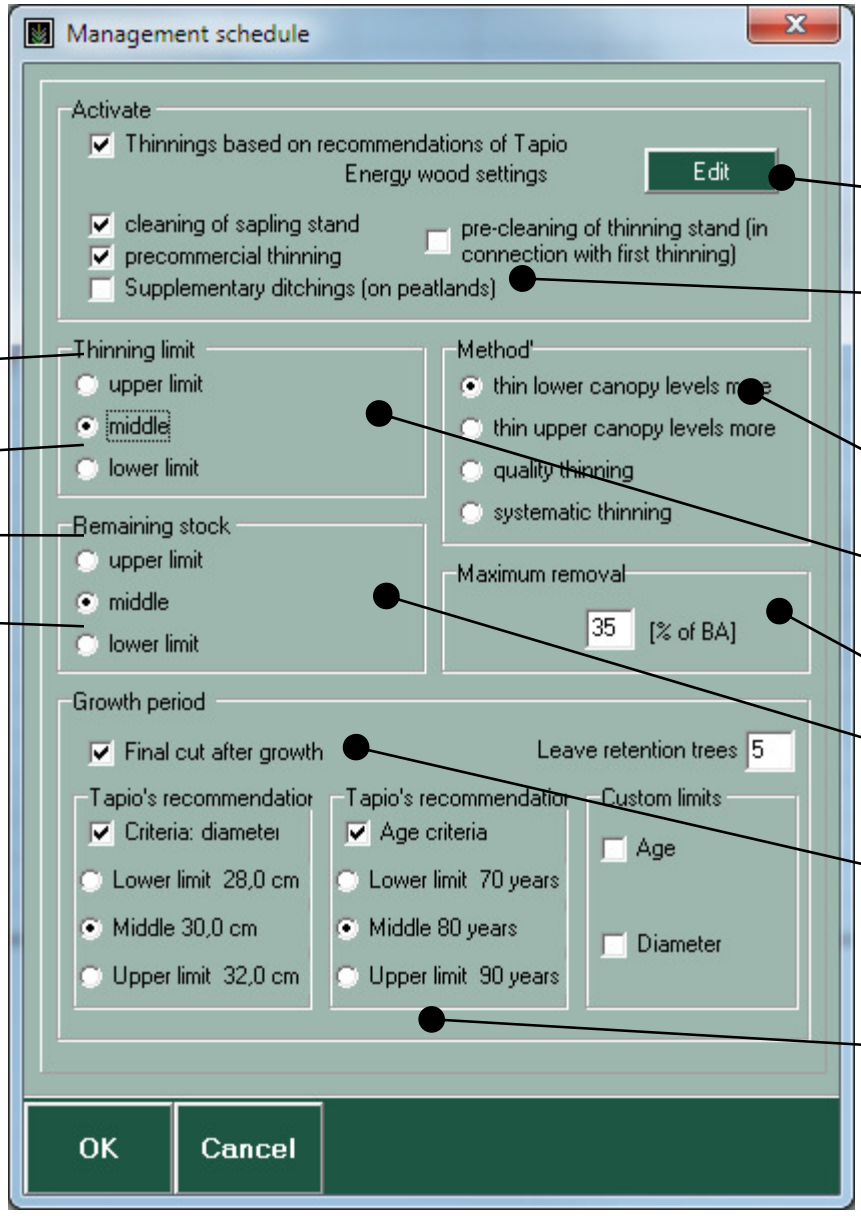
You can define a customized management schedule, which includes
- customized thinning program
- user-defined criteria for the final cut (stand age or stand mean diameter)

Customized management schedule is based on practical management recommendations for private forests of Finland.

You can customize the recommendations by altering e.g.
- maximum allowable stocking level before thinning
- thinning intensity
- thinning type (tree selection in thinning)

2.11. Management schedule (2/2)





Customize the management recommendations of Tapio

If you want to include energy wood to your management schedule click here.

Select the operations you want to include in the management schedule

Select the thinning method to thinnings

Select the thinning limit

Select maximum removal

Select the remaining stock

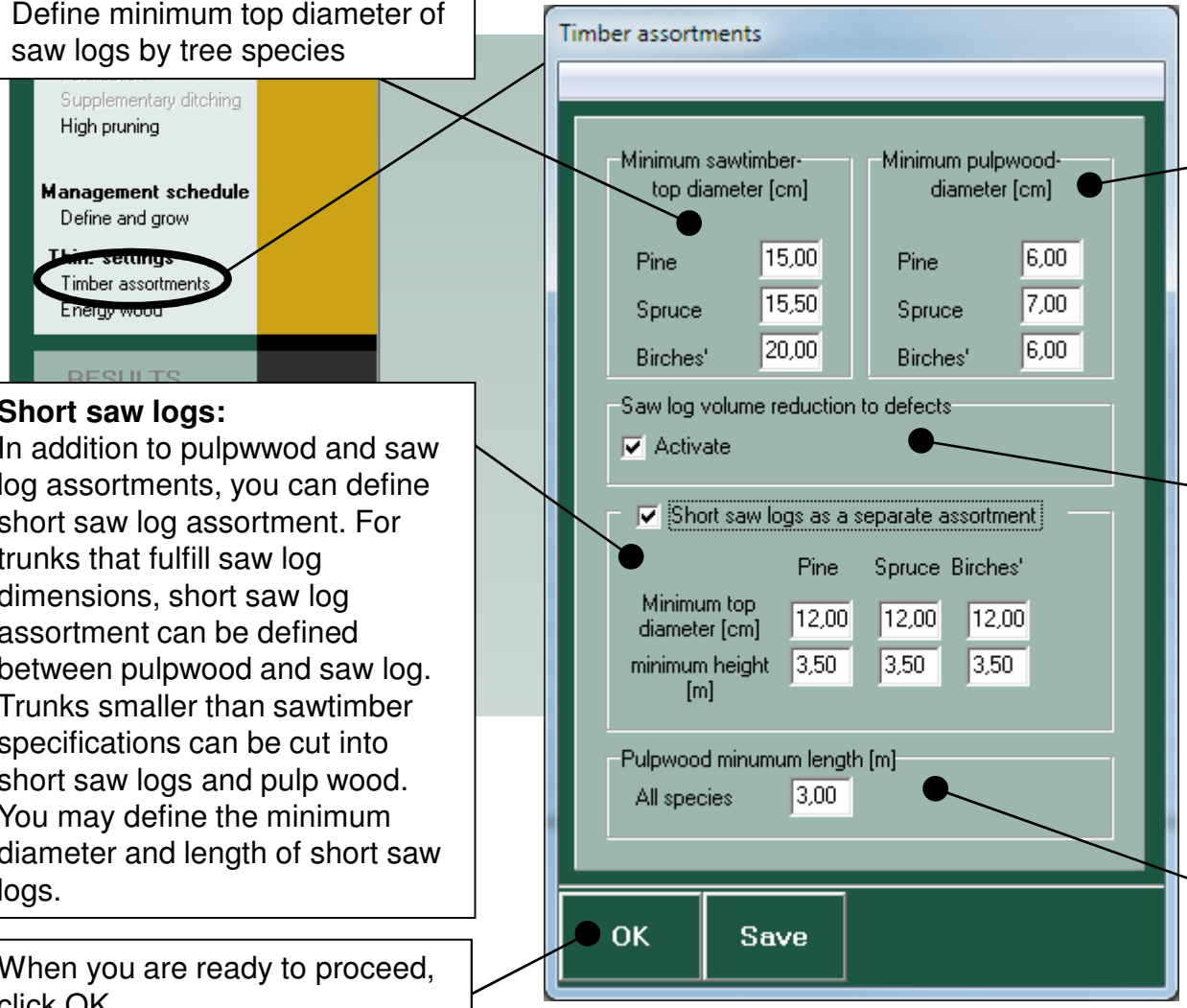
If you want to include final cut into your management schedule activate it here.

Final cut options are listed here. You pick age and/or dbh limits to the final cut.

2.11. Timber assortment definitions

Select: Thin. settings → Timber assortments

Define minimum top diameter of saw logs by tree species



Define the minimum diameter of pulpwood

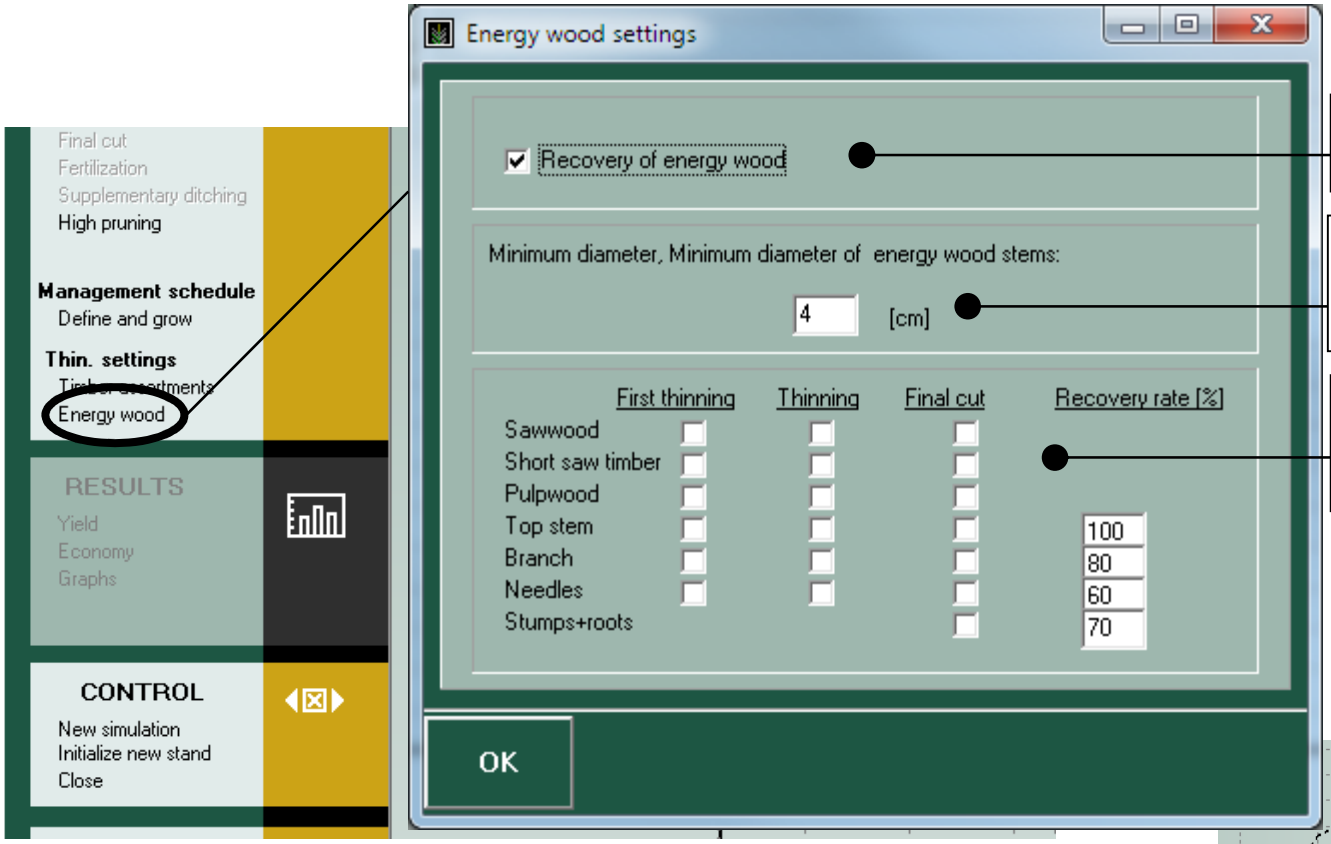
Short saw logs:
In addition to pulpwwod and saw log assortments, you can define short saw log assortment. For trunks that fulfill saw log dimensions, short saw log assortment can be defined between pulpwood and saw log. Trunks smaller than sawtimber specifications can be cut into short saw logs and pulp wood. You may define the minimum diameter and length of short saw logs.

Sawtimber reduction:
Due to different kind of defects in trunks, the actual saw timber yield is usually clearly lower than predictions based on stem dimensions only. The saw timber yield reduction models are based on timber quality measurements of the National Forest Inventory.

When you are ready to proceed, click OK

Define the minimum length of pulpwood

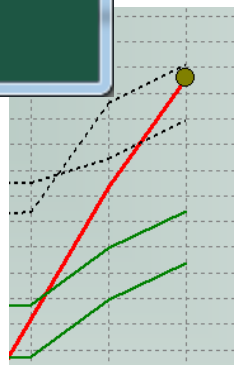
2.12 Recovery of energy wood



Activate energy wood selection here.

Set the diameter limit to select trees left outside energy wood selection.

Select the compartmerts to be collected as energy wood. You can also adjust the recovery rates.

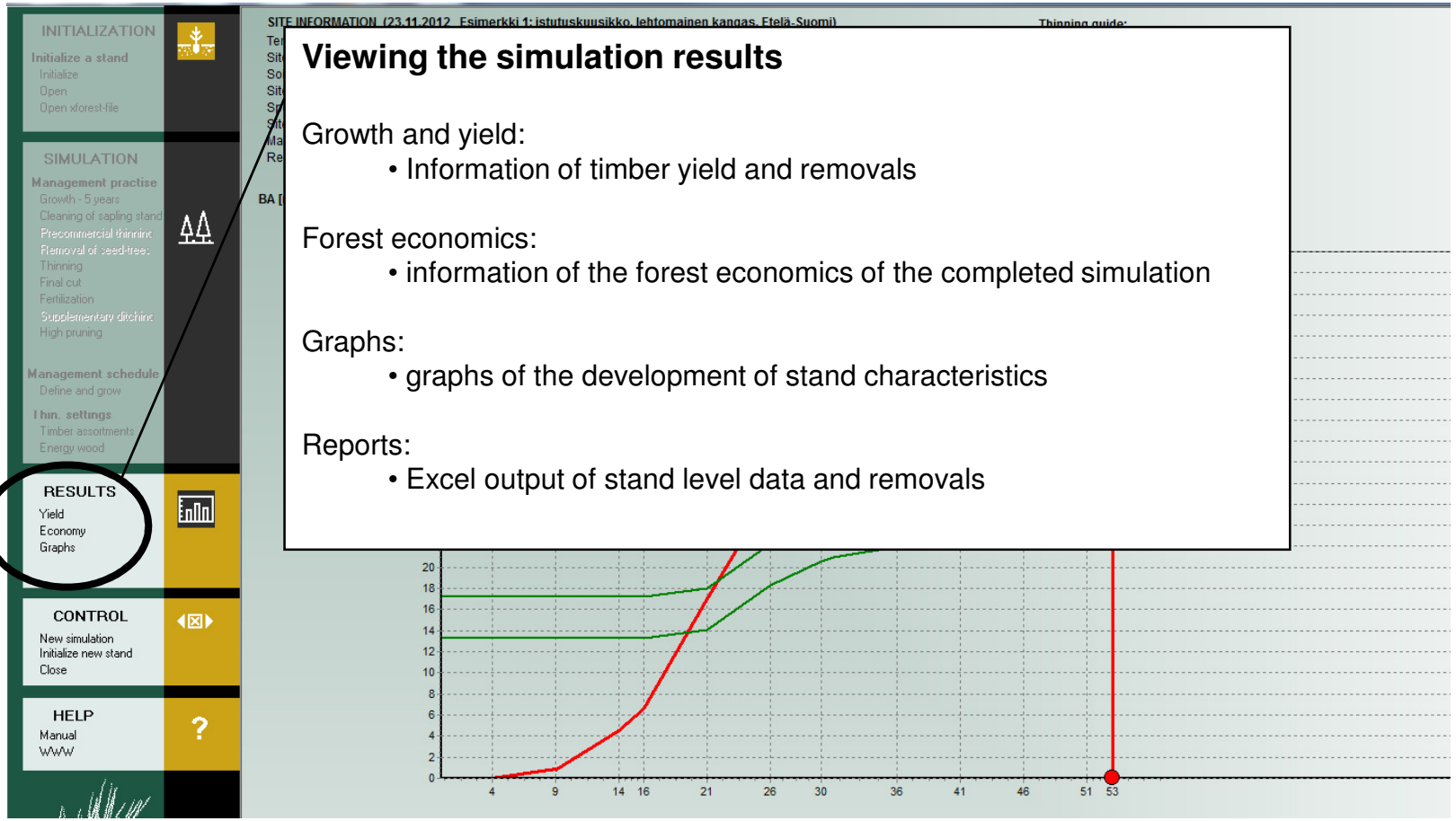


If recovery of energy wood is activated the red ball marking basal area level changes its color to green.

NOTICE!
Current changes will be applied only to the forthcoming thinnings.

Starting a new simulation resets these settings.

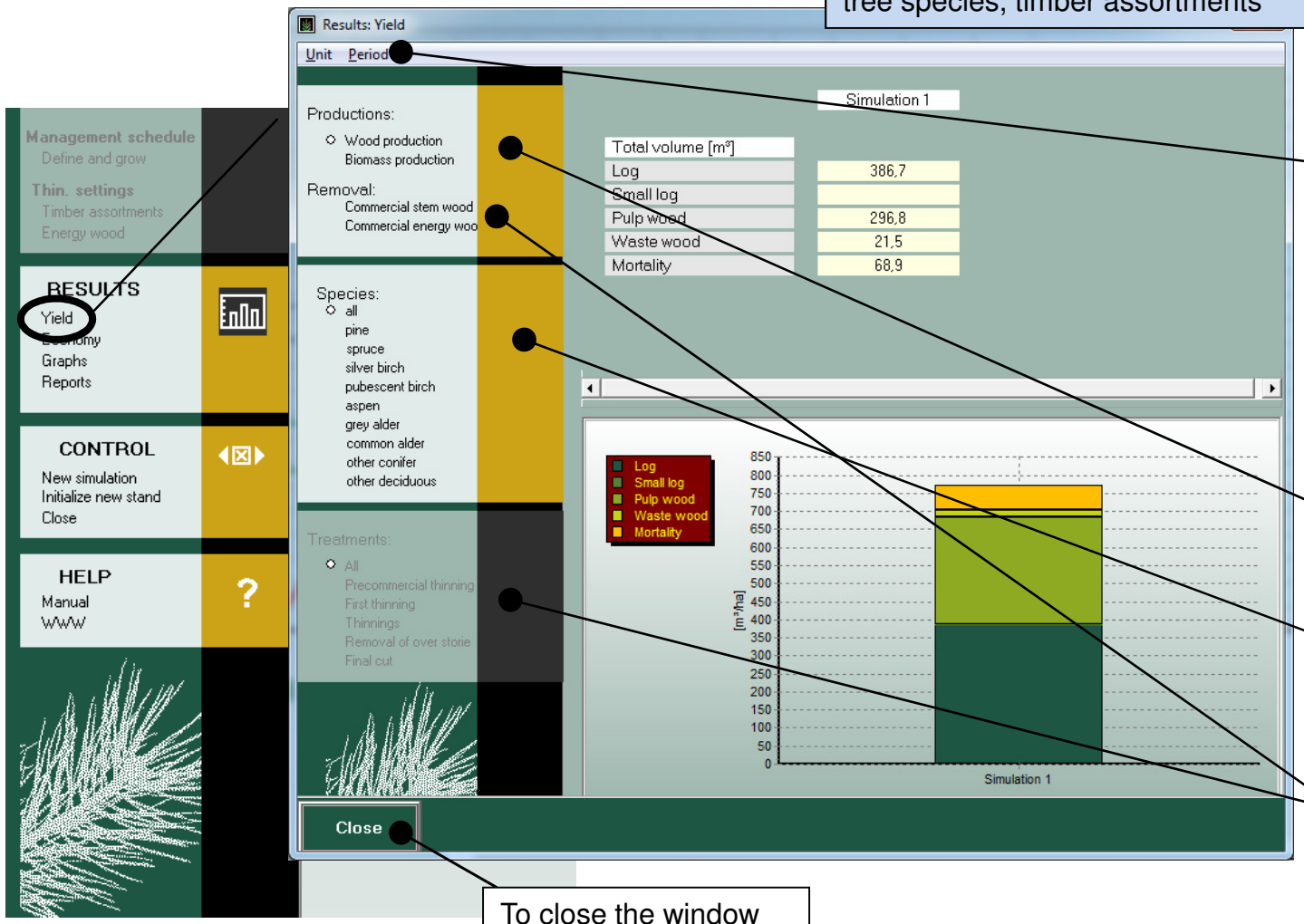
3. RESULTS


INITIALIZATION
Initialize a stand
Initialize
Open
Open xforest-file
SIMULATION
Management practise
Growth - 5 years
Cleaning of sapling stand
Precommercial thinning
Removal of seed-tree:
Thinning
Final cut
Fertilization
Supplementary ditching
High pruning
Management schedule
Define and grow
Thin. settings
Timber assortments
Energy wood
RESULTS
Yield
Economy
Graphs
CONTROL
New simulation
Initialize new stand
Close
HELP
Manual
WWW
Viewing the simulation results
Growth and yield:
• Information of timber yield and removals
Forest economics:
• information of the forest economics of the completed simulation
Graphs:
• graphs of the development of stand characteristics
Reports:
• Excel output of stand level data and removals

3.1. Yield

Choose: Yield

MOTTI produces tables and graphs of the predicted yield by tree species, timber assortments



From window menu you can choose:

Period:
- rotation period
- per year

Units:
- m^3/ha
- kg/ha

You can select the production or the removal.

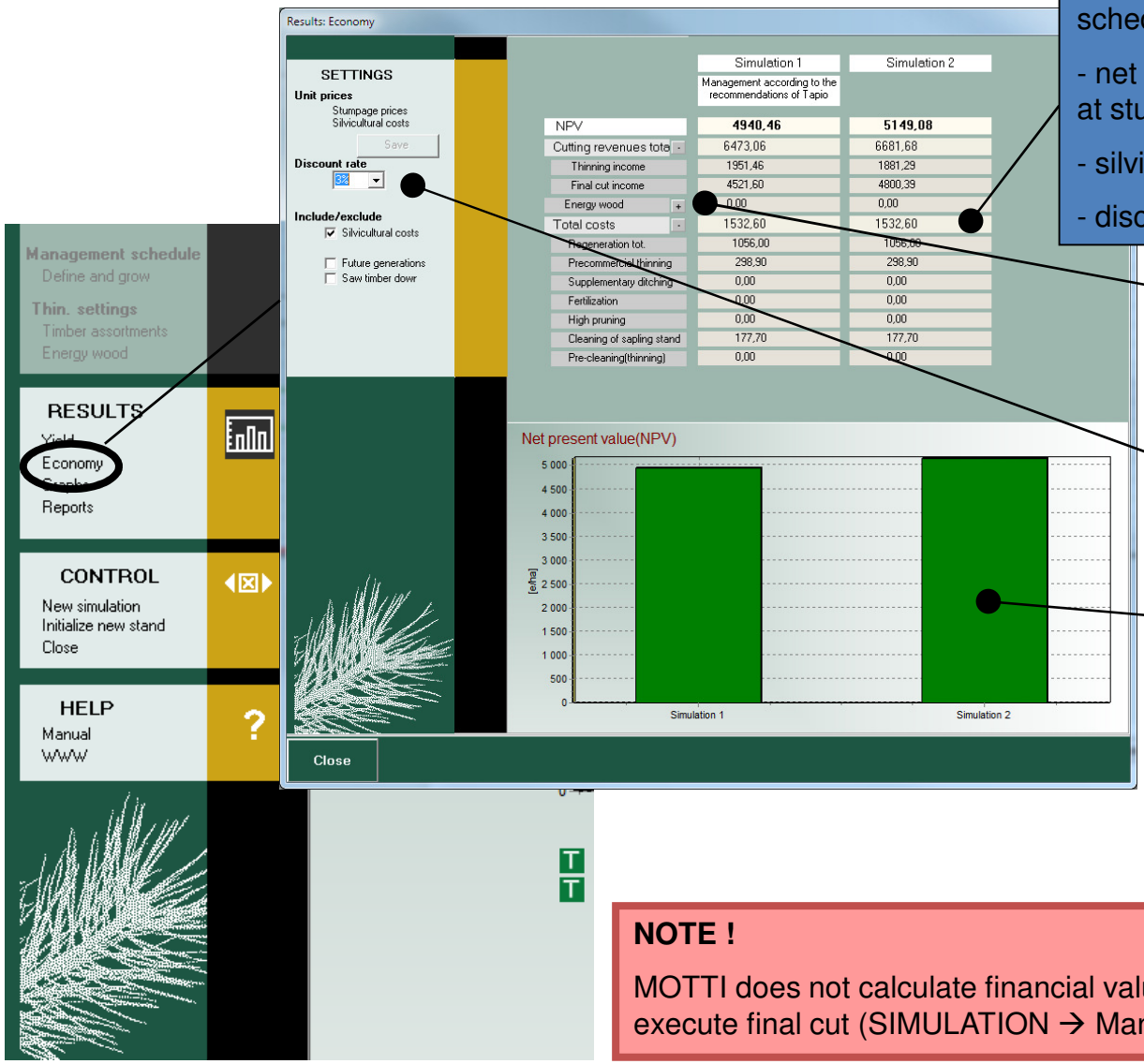
If you want to inspect only one species at time then make the selection here.

You can also select a specific cutting when commercial removal is selected.

To close the window click "Close"-button

3.2. Financial analyses

(1/4)



This table shows for each management schedule:

- net present values of cutting revenues (valued at stumpage)
- silvicultural costs
- discount rates 0%-6%

Press"+" button for more detailed table of revenues and costs

Choose the discount rate here

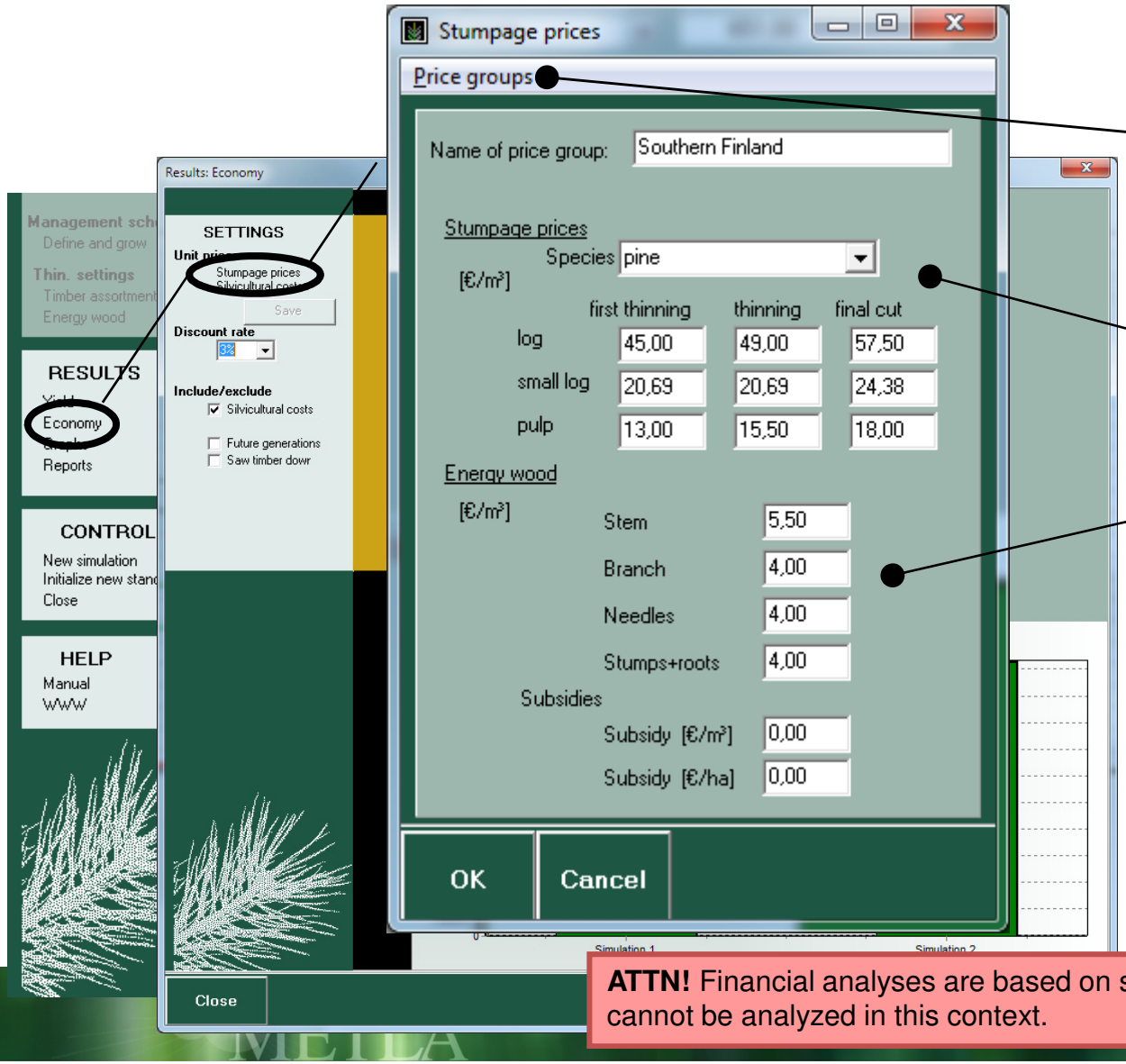
bar representing net present value according to given discount rate, €/ha

NOTE !

MOTTI does not calculate financial values unless the user has chosen to execute final cut (SIMULATION → Management practice→ Final cut)

3.2. Financial analyses (2/4)

Choose: Economy → Unit prices→ Stumpage prices



You can select and name a price group. There are six groups to store prices.

Selected price group is then the active price group. All the prices are taken from this group).

You can determine stumpage prices by tree species, timber assortments, and by cutting type, €/m³.

You can also adjust price to the energy wood and define subsidies.

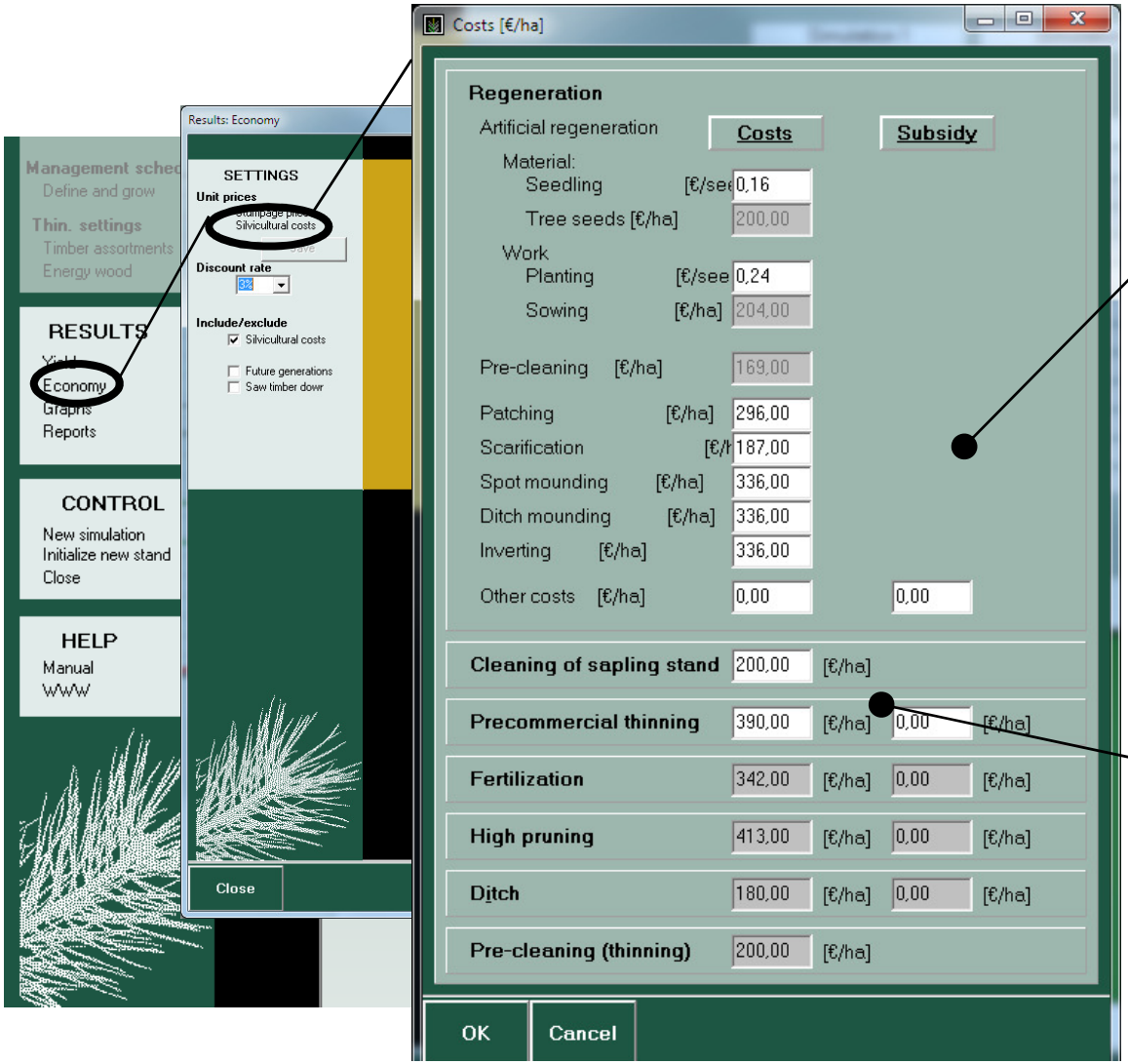
To save prices see page 4/4

ATTN! Financial analyses are based on stumpage prices. Harvesting costs cannot be analyzed in this context.

3.2. Financial analyses

(3/4)

Choose: Economy → Unit prices → Costs



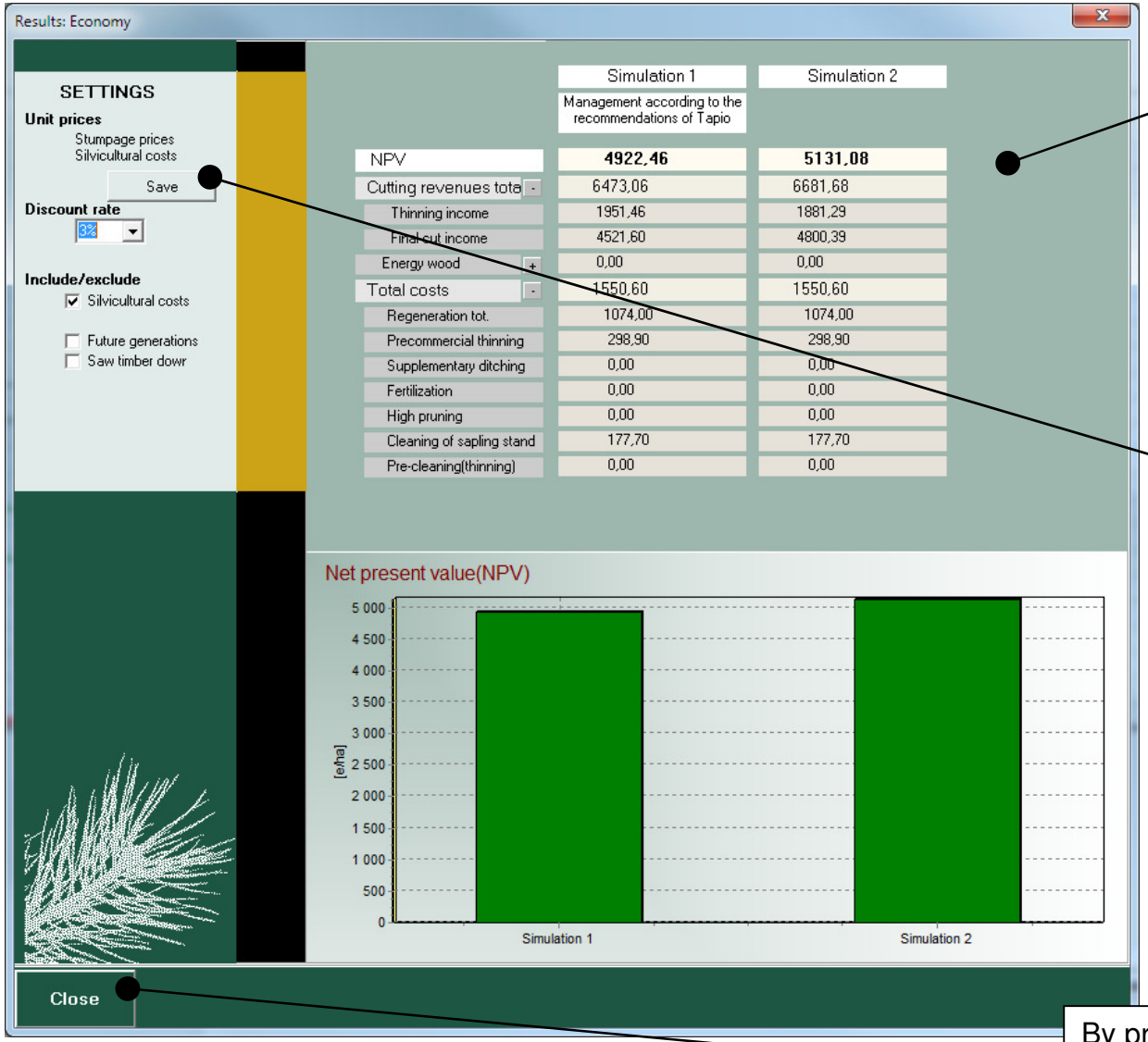
The user can determine individual unit costs (€/ha) for actions: fertilization, forest drainage, artificial regeneration, precommercial thinning and pruning. Government subsidies can also be given for each action.

By changing values (wood prices and/or costs), financial results are automatically updated according to the new values

To save prices see page 4/4

IMPORTANT: The implementation of management practices are determined in the SIMULATION module. In the Costs view, costs of those practices that have been carried out in simulation, are shown on white background, and can be modified. The costs shown in boxes with gray background are inactive and cannot be modified.

3.2. Financial analyses (4/4)



In this table, the results of all the simulations are displayed

Changing of stumpage prices, unit costs or discount rate affects the financial results of all the management schedules.

If you want save the changes you have made to stumpage prices or/and silvicultular costs press the “Save”-button.

Stumpage prices and silvicultular costs of a specific price group are always linked to together.

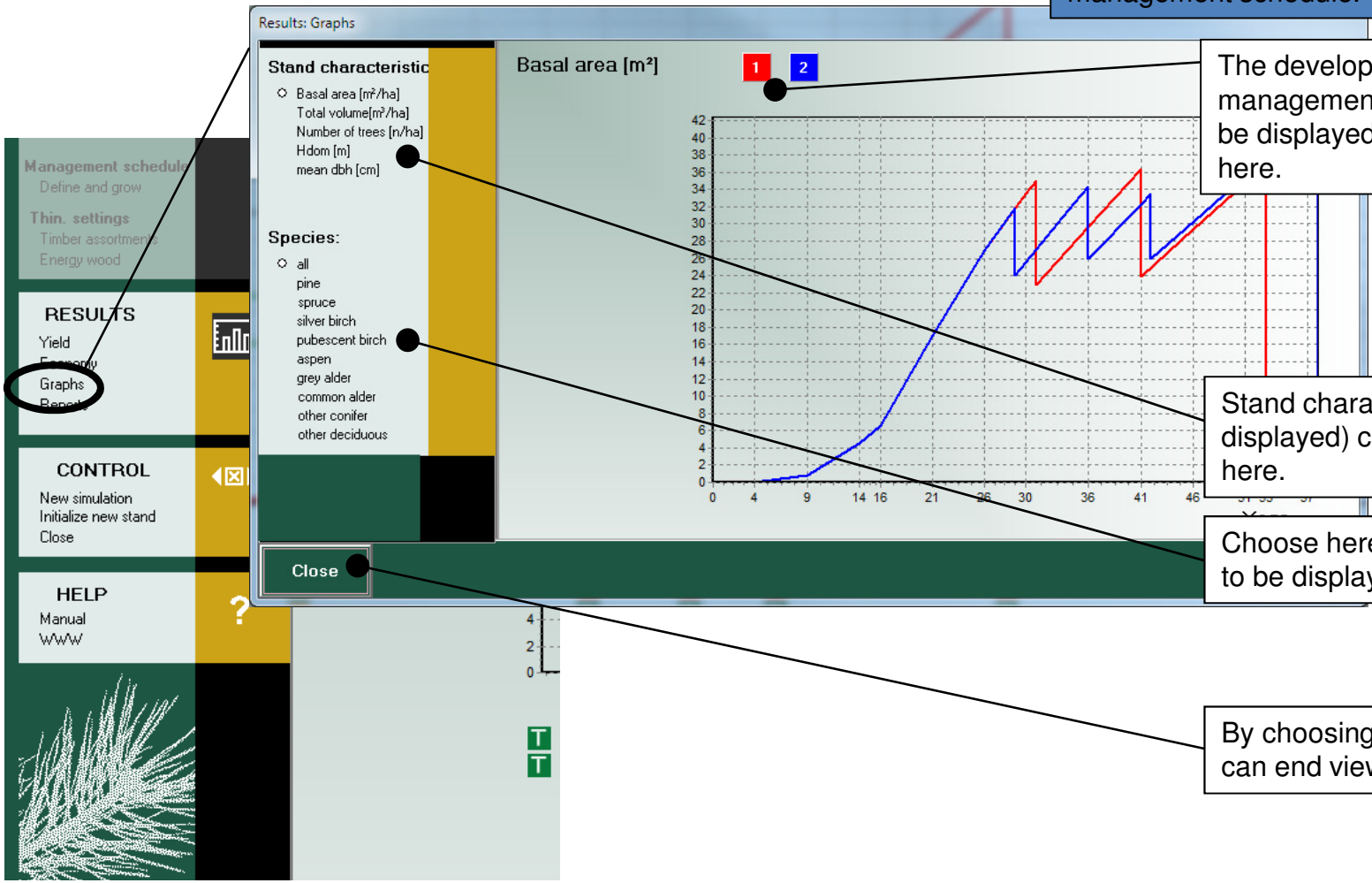
Pressing “Save”-button saves all the prices into to the active price group.

By pressing ”Close” button user closes the viewing of financial analyses

3.3. Graphics

Choose: Graphics

MOTTI produces graphics on stand characteristics associated with each management schedule.



The development curve(s) for management schedule(s) to be displayed can be chosen here.

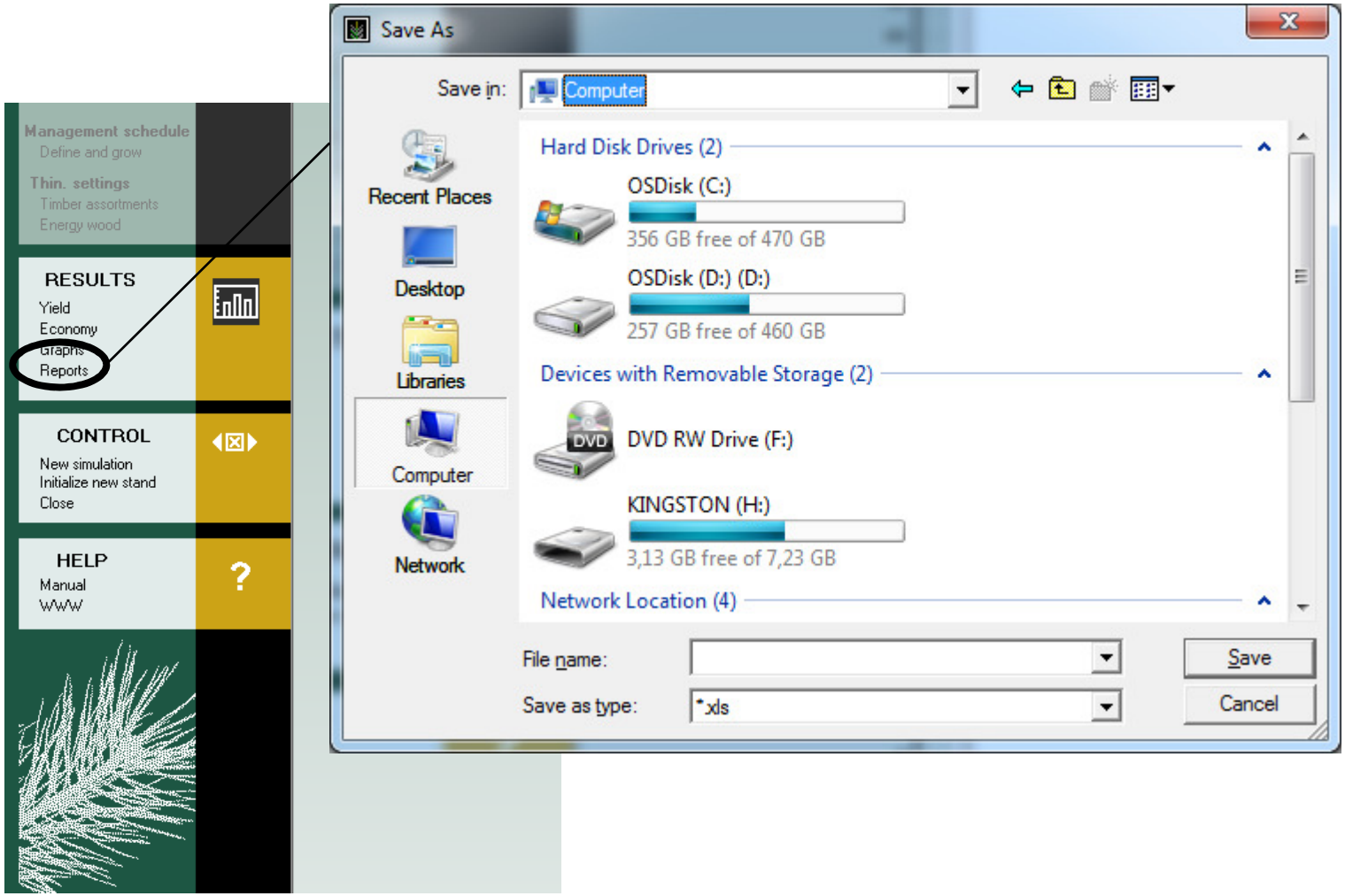
Stand characteristics (to be displayed) can be chosen here.

Choose here the tree species to be displayed.

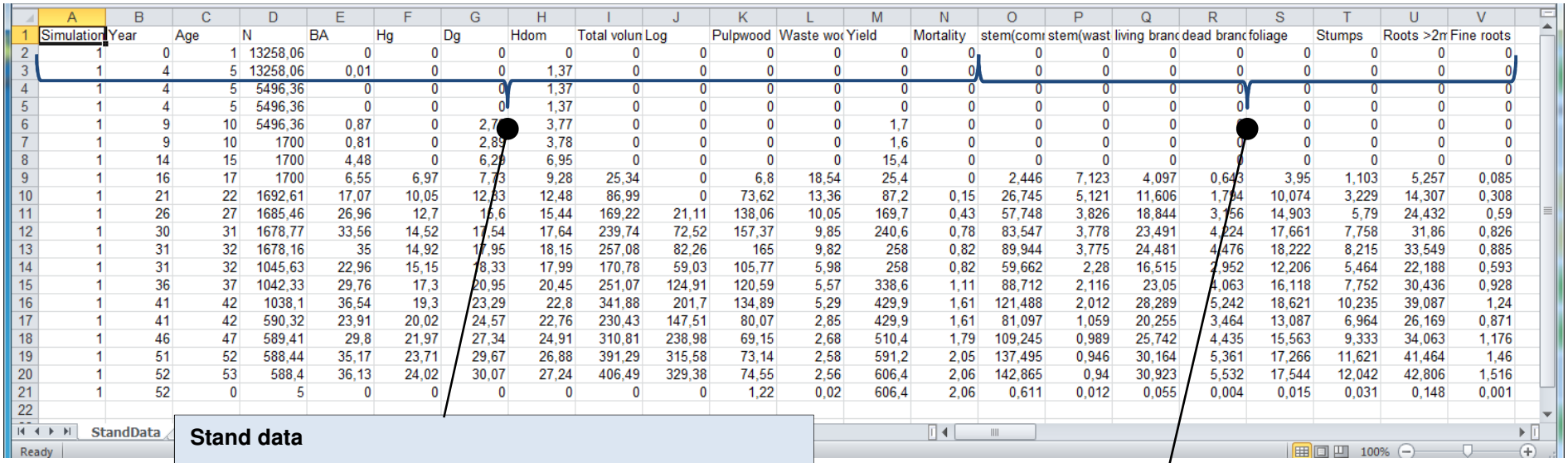
By choosing ”Close” the user can end viewing Graphics.

3.4. Reports

Choose: Reports



3.4. Reports

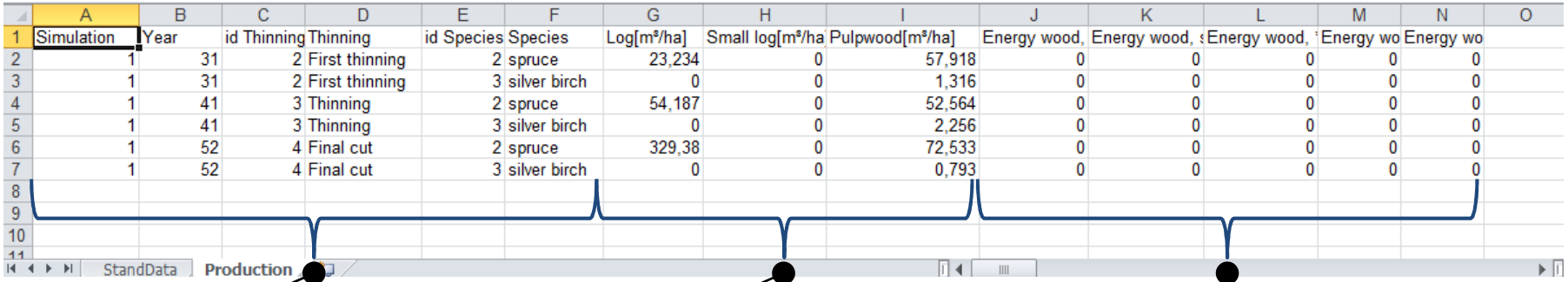


Simulation	Year	Age	N	BA	Hg	Dg	Hdom	Total volun	Log	Pulpwood	Waste woo	Yield	Mortality	stem(comm	stem(wast	living branc	dead branc	foliage	Stumps	Roots >2m	Fine roots
1	0	1	13258,06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4	5	13258,06	0,01	0	0	1,37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4	5	5496,36	0	0	0	1,37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4	5	5496,36	0	0	0	1,37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	9	10	5496,36	0,87	0	2,7	3,77	0	0	0	0	1,7	0	0	0	0	0	0	0	0	0
1	9	10	1700	0,81	0	2,89	3,78	0	0	0	0	1,6	0	0	0	0	0	0	0	0	0
1	14	15	1700	4,48	0	6,29	6,95	0	0	0	0	15,4	0	0	0	0	0	0	0	0	0
1	16	17	1700	6,55	6,97	7,73	9,28	25,34	0	6,8	18,54	25,4	0	2,446	7,123	4,097	0,643	3,95	1,103	5,257	0,085
1	21	22	1692,61	17,07	10,05	12,83	12,48	86,99	0	73,62	13,36	87,2	0,15	26,745	5,121	11,606	1,794	10,074	3,229	14,307	0,308
1	26	27	1685,46	26,96	12,7	15,6	15,44	169,22	21,11	138,06	10,05	169,7	0,43	57,748	3,826	18,844	3,756	14,903	5,79	24,432	0,59
1	30	31	1678,77	33,56	14,52	17,54	17,64	239,74	72,52	157,37	9,85	240,6	0,78	83,547	3,778	23,491	4,224	17,661	7,758	31,86	0,826
1	31	32	1678,16	35	14,92	17,95	18,15	257,08	82,26	165	9,82	258	0,82	89,944	3,775	24,481	4,476	18,222	8,215	33,549	0,885
1	31	32	1045,63	22,96	15,15	18,33	17,99	170,78	59,03	105,77	5,98	258	0,82	59,662	2,28	16,515	2,952	12,206	5,464	22,188	0,593
1	36	37	1042,33	29,76	17,3	20,95	20,45	251,07	124,91	120,59	5,57	338,6	1,11	88,712	2,116	23,05	4,063	16,118	7,752	30,436	0,928
1	41	42	1038,1	36,54	19,3	23,29	22,8	341,88	201,7	134,89	5,29	429,9	1,61	121,488	2,012	28,289	5,242	18,621	10,235	39,087	1,24
1	41	42	590,32	23,91	20,02	24,57	22,76	230,43	147,51	80,07	2,85	429,9	1,61	81,097	1,059	20,255	3,464	13,087	6,964	26,169	0,871
1	46	47	589,41	29,8	21,97	27,34	24,91	310,81	238,98	69,15	2,68	510,4	1,79	109,245	0,989	25,742	4,435	15,563	9,333	34,063	1,176
1	51	52	588,44	35,17	23,71	29,67	26,88	391,29	315,58	73,14	2,58	591,2	2,05	137,495	0,946	30,164	5,361	17,266	11,621	41,464	1,46
1	52	53	588,4	36,13	24,02	30,07	27,24	406,49	329,38	74,55	2,56	606,4	2,06	142,865	0,94	30,923	5,532	17,544	12,042	42,806	1,516
1	52	0	5	0	0	0	0	0	0	1,22	0,02	606,4	2,06	0,611	0,012	0,055	0,004	0,015	0,031	0,148	0,001

Stand data

Simulation: number of simulation
Year: Simulation year
Age: Age of stand
N: Number of trees/ha
BA: Basal area
Hg: Weighted mean height, m
Dg: Weighted mean diameter, cm
Hdom: Dominant height
Total volume: Volume of living stock
Log: Log volume of the living stock
Pulp wood: Pulp wood volume of the living stock
Waste wood: Waste wood volume of the living stock
Yield: Total yield. Living stock+removal+mortality, m^3/ha
Mortality: Volume of dead trees, m^3/ha

Stand data
***Biomass variables*, 1000 kg/ha**
Stem (commercial wood)
Stem (waste)
Living branches
Dead branches
Foliage
Stumps
Roots > 2 mm
Fine roots



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Simulation	Year	id Thinning	Thinning	id Species	Species	Log[m³/ha]	Small log[m³/ha	Pulpwood[m³/ha]	Energy wood,	Energy wood, s	Energy wood, '	Energy wo	Energy wo	
2	1	31	2	First thinning	2	spruce	23,234	0	57,918	0	0	0	0	0	
3	1	31	2	First thinning	3	silver birch	0	0	1,316	0	0	0	0	0	
4	1	41	3	Thinning	2	spruce	54,187	0	52,564	0	0	0	0	0	
5	1	41	3	Thinning	3	silver birch	0	0	2,256	0	0	0	0	0	
6	1	52	4	Final cut	2	spruce	329,38	0	72,533	0	0	0	0	0	
7	1	52	4	Final cut	3	silver birch	0	0	0,793	0	0	0	0	0	
8															
9															
10															
11															

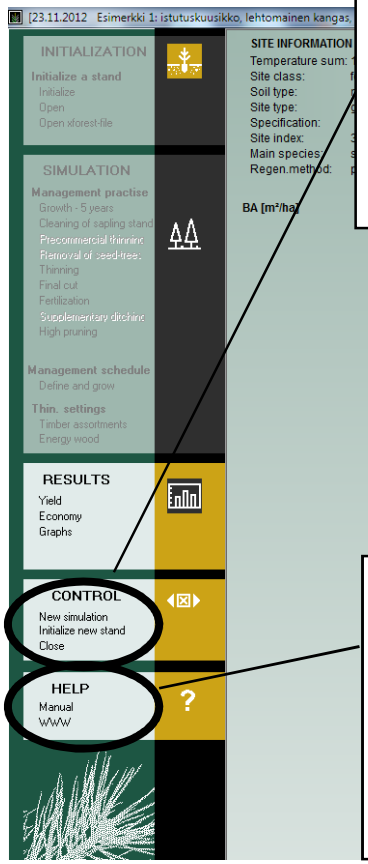
StandData | Production

Removal info
-Simulation
-Year
-Id Thinning
-Thinning
-Id species
-Species

Removal, collected as commercial *wood, m³/ha*
-Log, m³/ha
-Small log, m³/ha
-Pulp wood, m³/ha

Removal, collected as e*nergy wood, m³/ha*
- Stem, commercial wood
- Stem, waste wood
- Branches, living
- Branches, dead
- Stumps and root

4. Navigation and guidance



Control Panel of MOTTI stand simulator

New simulation:

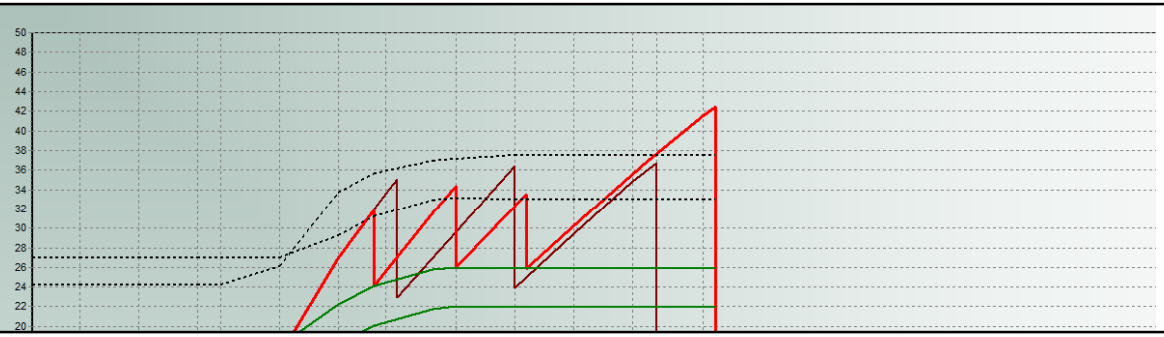
- start a new simulation of the same stand

Initialize new stand:

- choose a new stand for simulation

Close:

- closes Motti session



Help

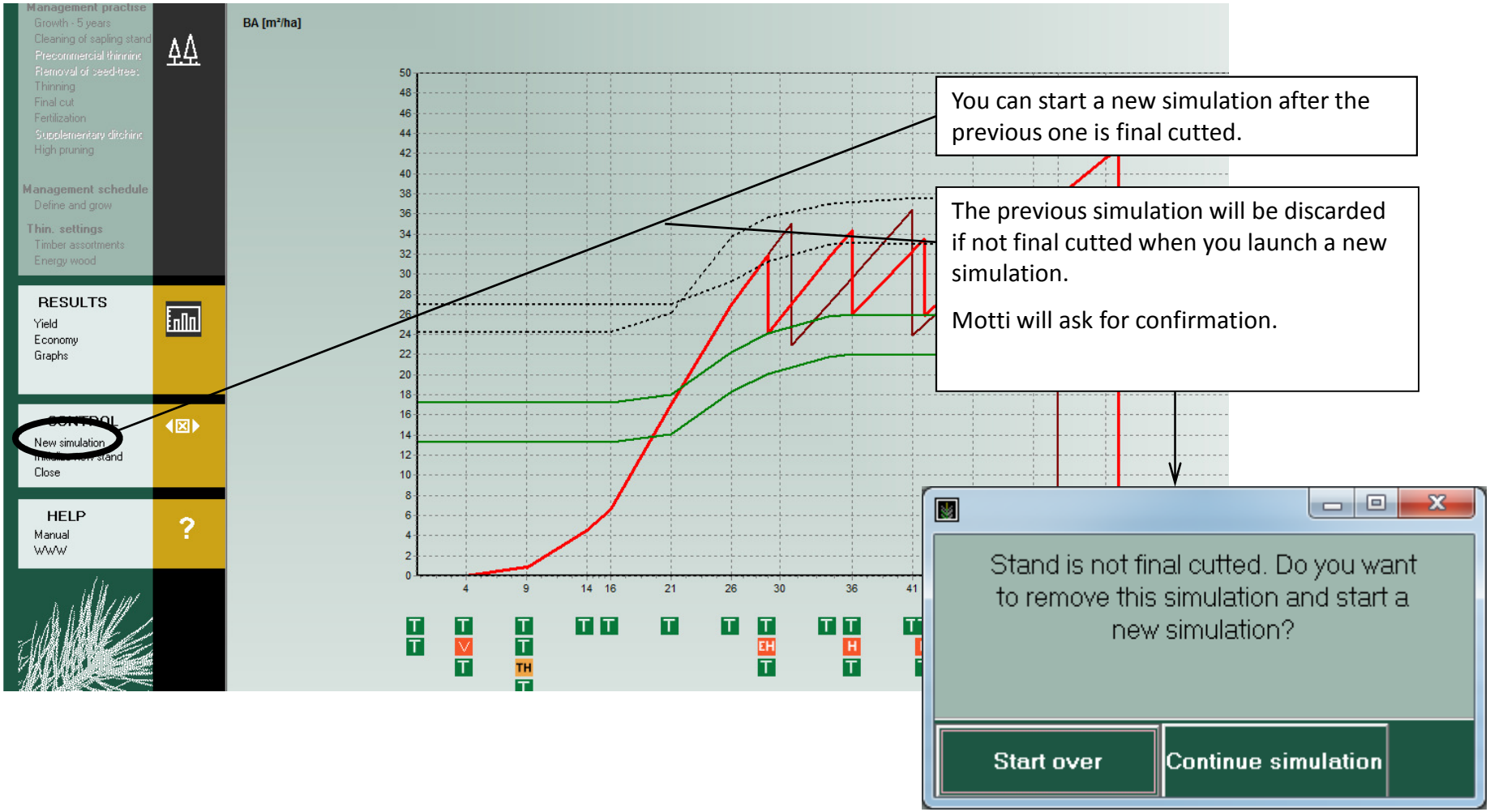
Manual:

- You can open the User's guide in pdf-format from here.

WWW-site:

- You can open the homepage of MOTTI-software from here (www.metla.fi/metinfo/motti/).

4.1. New simulation



4.2. Initialize new stand